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EDITORIAL.

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MYOCLONY.—In their excellent dictionary of technic medical terms, Garnier & Delamare give the definition of this word as: "*Clonic muscular contractions, sudden, similar to the jerkings due to electric shock, involuntary, not systematized, more or less disseminated, and repeating themselves at various intervals. It is the principal symptom of various nervous affections.*"

In a recent review written by Prof. Cadeac in the *Journal of Zootechnie* the learned writer says: "Under that name are designated syndroms characterized by clonic contractions, more or less rhythmical or irregular, of striated muscles, with or without displacement of the parts upon which these muscles are inserted. These contractions take place only on some muscles, corresponding to some nerves or again affect several parts of the body, often repeating themselves by isolated accesses, separated by intervals more or less long of perfect calm or again lasting for various lengths of time."

From this definition every one recognizes those various muscular manifestations which are most spoken of as chorea and are observed in all animals.

In solipeds all the striated muscles of the head, of the limbs and of the trunk, principally the diaphragm, may present those clonic manifestations.

In bovines, myoclonus has frequently been observed, and described under the name of chorea.

In lambs a myoclony can be observed characterized by sudden convulsive jerkings, of irregular intensity, rhythmical, generalized or localized in the head and the extremities.

In young swine, the muscles of the head, legs and sometimes all the muscles of the trunk exhibit clonic rhythmical contractions in various regions, or in one region only.

With dogs, they are most commonly the sequelae of distemper and are closely connected with the myelitis improperly described under the name of chorea.

If in solipeds flat muscles, such as the masseters, or the crotaphites, are often the seat of fibrillary twistings or again of bilateral spasmodic closing and opening of the eyelids are observed, or again similar contractions are noticed in the cutaneous muscles, those of the face and extending to other parts of the body, to such an extent that the possibility of tetanus being present may be justified, because of their becoming generalized, there is one which is more peculiar because of its remaining localized, that is the myoclony of the diaphragm, although it is sometimes also connected with myoclony of the abdominal muscles.

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Myoclony of the diaphragm is a syndrom of no serious nature which, however, frightens those who see it for the first time. Known as spasms of the *diaphragm*, *clonic spasms*, *palpitations of the heart*, *hiccough*, *respiratory or abdominal palpitations*, *cardial neurosis*; the symptoms that it presents have their intensity round that muscle, while if the abdominal muscles are taken, they are observed more at the flank.

In his review, Cadeac divides the manifestations into physical and rational. In closing the extract, let us glance at them.

With the former, jerkings or kinds of palpitations are marked by sudden, intermittent and regular raising of the hypochondriac region. More manifest on the left than on the right, their maximum of intensity is about the middle third of the limit of the thoracic and abdominal cavities. They may be so powerful as to

shake the whole body and may be heard 10, 12 or even 15 steps away. Applied on the last ribs, the hand receives an energetic knock, which increases all along the diaphragm. Very light, on a level with the heart, they seem limited only to a portion of the diaphragm. Their relations with the cardiac systoles are not constant, being sometimes but 10 to 15 a minute, or again as numerous as the cardiac contractions; they may be isochronous with the precordial shock; they are ordinarily isorythmical and heterochronous, but following closely the ventricular contraction. They become stronger and more frequent by exercise.

They are often accompanied with a sudden expiration, jerky, short, as in hiccough of man, and followed by a loud rattling at the throat or a kind of smothered moan. The muscles of the cervical region may at the same time be also contracted as in lockjaw, while those of the trachelian region are relaxed. By auscultation a dull, not clear, deep murmur is heard, diminishing towards the posterior part of the animal and the anterior regions of the chest.

The rational manifestations are described by Cadeac as follows: "The flanks are intersected; the respiration is subsultory; placed near the nostrils, the ear perceives three inspirations coinciding with the pulsations; each of these inspirations is followed with an expiration so weak and short that the current of expired air cannot be felt; the fourth inspiration is followed by a strong and long expiration, which lasts during three palpitations; then breathing starts again with the same phenomena returning."

Often much prostrated, the animal generally manifests no uneasiness, or anxiety and is as gay and natural as ordinarily.

When the abdominal muscles are affected, the distinction is easily made, the contraction of the muscles being noticed and felt on the flank; there is besides synchronism between the breathing and the retraction of the epigaster and the elevation of the intercostal spaces.

We hope that this description will make our friends fully acquainted with that ailment, which I believe is often described under the name of *Thumps*.

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ON RABIES AGAIN.—In our January chronicle, I made some extracts relating to experiments which Professor Noguchi had made at the Rockefeller Institute which I concluded in saying that the discovery of Professor Noguchi would throw a brilliant light on the pathogeny of rabies, which would be admired the world over, and I might add would attract general attention.

It indeed has, and has also stimulated the investigations of others. Professor G. Volpino of the Royal University, Institute of Hygiene, of Turin has just sent to the *Presse Medicale* results of some researches he has made on the same subjects. He writes:

"Prof. Noguchi having stated that in cultures made with rabid material, according to the method he used for the culture of the spirochetes of recurrent fever he had found granulated and sometimes nucleated corpuscles that he interpreted as the morphological representatives of rabid virus."

"We (Prof. Volpino) have undertaken, since several months, investigations so as to obtain culture of the rabid virus, according to the technic of Noguchi and in these we have had occasion to observe in the microscopic preparations special formations deserving publication. * * * In two preparations we found elements very similar to those of Prof. Noguchi, and also formations of a uniform pale blue, bluish formations with a clear center, perfectly discolored or colored rosy. Some of them presented in the center one or two granulations purplish or dark blue in color which seemed to be on the way to segmentation. Single, sometimes by two or by three, free and in form of cocci, there were also formations with cystic appearance.

"At first we thought we had cultivated the virus of rabies and that we had found the corpuscles described by Noguchi, but later on we found these same formations in other preparations, which were not taken from cultures of rabid virus."

Further researches having demonstrated that a great number of these formations had the form, the dimensions, the peculiarities of structure with the corpuscles described by Noguchi, Volpino concludes that the corpuscles that he has observed do

not represent forms of the rabid virus, but were small droppings coming from the lipoid substance of the fluid in which the cultures had been made and taken from the original ones he had made.

Without denying the possibility of the culture of the virus of rabies according to the technic of Prof. Noguchi, and suggesting that possibly there may be some differences between the formations spoken of by Noguchi and his, Volpino says that one cannot conclude the living nature of certain formations, because these have been found in a tube of virulent culture.

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THE DIAGNOSIS OF RABIES has been the occasion for the publication of a remarkable communication in the *Annales de l'Institut Pasteur* by Madame Doctoresse Lina Negri Luzzani, from the laboratory of Prof. Golgi of the University of Partia. The authoress confirms Negri's method.

To make out a positive diagnosis, one must have the head of the suspect animal and proceed before anything to the examination of the horn of Ammon, in the fresh condition. This examination alone will almost always be sufficient to make the diagnosis.

After giving her *modus operandi* and a long consideration on the methods of coloration she resorts to, the authoress concludes:

1. In the present stage of our knowledge, the demonstration of the specific parasite described by Dr. A. Negri is the surest means of making a rapid diagnosis of rabies not only in dog, but in all the animals susceptible to contract rabid infection.

2. In ordinary practice it is sufficient, in searching for it, to look in the horn of Ammon, in which the parasites are more numerous, with more developed forms and in the most precocious period of the disease. However, if one has not at his disposal for examination the horn of Ammon, that of any other region of the nervous system (cerebral structure, cerebellum, cerebro-spinal ganglions) can be used for the diagnosis.

3. Among the methods recommended by the various authors so as to facilitate and make rapid the demonstration of the parasite, the method of Negri is the simplest and the quickest. Examination of preparations, in fresh condition, is alone sufficient in the majority of cases, to detect the presence of the parasite. If the result is negative, the coloration of Mann of sections fixed in Zenker and enclosed in paraffin, is the best to bring out the most minute forms of the parasite.

4. The presence of the Negri bodies allows the positive affirmation of the diagnosis of rabies, with exclusion of all ulterior proof; but, on the contrary, if the microscopic examination has given a negative result, one must resort to the experimental test of inoculation. In a small number of cases excepted, the negative microscopic examination will correspond to a positive experimental test.

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ABOUT MALLEINE.—Several months ago there appeared in one professional journal, a notice which was certainly made to draw attention and might have serious sequelae in the veterinary world and amongst stock breeders and owners of horses. This notice read that after numerous experiments made in the Russian army, the Secretary of War of that country had prohibited the use of malleine, at least on horses free from suspicious symptoms. Before taking this decision, an inquiry had been made near the principal scientific authorities of Europe and this inquiry was not entirely in favor of the injection of the revealing toxine. Among these authorities were mentioned the names of Profs. Damman, Ostertag, Hutyra, Edelman, Froehner, Perroncito, etc., etc.

At one of the meetings of the Société Centrale, Mr. Moulleron, the actual chief of the Cavalry of the Company of Omnibuses in the City, with which he has been connected for years, has brought the subject before his colleagues and read a paper which is the most imposing argument that could be brought in relation to the benefit obtained by the use of malleine.

"In looking over my notes," said Mr. Mouilleron, "I see that from January, 1893, to January, 1913, I have the record of 42,653 tests of malleine, and on this number, rather sufficiently high, I have had *no positive error*, that is on animals whose reaction was *positive*, except in five cases. All the others that had reacted and were killed had the diagnosis revealed by malleine, confirmed at post mortem. The five cases that gave negative reaction being killed proved also to be glandered." As Mr. Mouilleron has had the opportunity of seeing cases where the thermic reactions were late (in three cases, 18 hours after the injection; twice, 22 hours after; twice, 26 hours; and in one case the local reaction having appeared at the fifty-second hour, although the hyperthermy had developed normally and remained three days), the question might be asked if the conclusions of the five negative cases had not been made too hastily.

By the use of malleine, glanders has been wiped out and kept out for years from the stock of that large company.

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After this powerful exhibition of the results and of the benefits that were obtained by the use of malleine, Mr. Mouilleron makes some restrictions on the method of the application of the reactive agent and gives some indications upon the value of the three principal manifestations, the condition of the temperature, the local and the general reaction, which are the elements upon which the diagnosis is established.

"The reacting trial does not always appear in the normal delay; one and sometimes two may be wanted and yet the three factors not having an equivalent diagnostic value, it is nevertheless possible to make out if one is or not in the presence of a concealed manifestation of the disease.

"Alone, the hyperthermy is not sufficient to diagnose glanders; it may give a certain suspicion which demands a further observation of the suspect subject, and a second test after ordinary length

of time, by which the diagnosis may be definitely established. First, when malleine was introduced in the fight against glanders a great importance was attached to that reaction, to its graphic, and there was a tendency to condemn animals with this single manifestation. There was a true and abusive excess which has, however, disappeared a long time since.

"If the thermic elevation alone is not sufficient to reveal the existence of glanders, the local reaction, on the contrary, even if alone, is sufficient to clearly demonstrate it. It is not necessary that the oedematous swelling be very large, with its peculiar form, warm, painful and with lymphatic tracts radiating in all directions, it is sufficient that it be present, a little spread, thick and, above all, that its sensibility be exaggerated to conclude with certainty at the presence of the glanderous affection.

"For the general reaction, it may be absent without diminishing the value of the diagnosis; it has always appeared to the author, apart in very virulent cases, such as in acute glanders, that it seemed to have an individual character, nervous and irritable subjects always presenting it; dull and lymphatic on the contrary manifesting it only rarely."

To resume, there is no necessity to be as exclusive towards the use of malleine as it had been reported it was ordered, as after its powerful assistance already rendered, it may no doubt render immense services by the delicate sensibility of its revealing qualities wherever large collections of horses may exist.

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CONTAGIOUS PUSTULAR DERMITIS.—Army veterinarians have often opportunities that are not offered to the private practitioners of seeing and observing, from beginning to end, epizootic affections.

An opportunity having presented itself to Messrs. Fontaine and Mespoulet, of the Saumur Cavalry School, to observe an epizooty of contagious pustular dermatitis they made a clinical and

bacteriological study of it and recorded it in the *Military Veterinary Review*.

This epizooty prevailed among the horses of the Cavalry School, affecting some thirty cases. It was supposed to be due to the introduction of a new lot of horses coming from Paris.

The eruption was manifested by a more or less large number of pustules on the withers, the back, the ribs and even the rump. Before the apparition of these pustules, there was a symptom which so far has not been described in classical works, viz.: That the horses would lick themselves persistently over different parts of the body, even in places where eruptive lesions would not appear after.

The evolution was ordinary; a small pimple on the skin, with the hairs raised and soon becoming the seat of a citrine exudation. The lymphatic blood vessels starting from this spot were very painful; after forty-eight hours the soreness would disappear and a scab was formed under which there was greenish pus in a small cutaneous excavation. Left to themselves, the pustules would get well in about 20 days and the hairs grow over.

Pus, taken after pulling the hairs, and crust were taken for microscopic examination to make cultures and experimental inoculations.

The pathogenous agent was found to be a fine rod with round extremities and having sometimes the form of a cocco-bacillus; it takes the Gram. In cultures the microbe is polymorphous; in peptoned beef bouillon it appears much finer than in the pus; it first clouds the medium, then collects in the bottom of the tube, forming a deposit more or less abundant.

On other cultures, gelose, serum, etc., there are formed after a few days small whitish yellow spots. On horse serum the colonies described in classical works were not found by the authors.

They believe that the bacillus that they have observed is somewhat different from the classical bacillus.

Experimentally the disease can be easily reproduced in putting

on the intact skin of a healthy animal one drop of pus, or of culture or in rubbing virulent products over it. After an incubation of two to four days, pustules appear similar to the spontaneous one.

In cases of natural contagion, the authors believe that the incubative stage lasts longer, sometimes more than one month; frictions and rubbings with soiled harnesses being the cause.

Laboratory animals, white mice, guinea pigs and rabbits, readily take the affection by subcutaneous inoculation of pus or cultures.

The bacillus resists dessication, but is readily destroyed with antiseptics; the microbial virulency is so much greater when the lesions are more recent; they are so much more active when they are younger.

This affection will certainly be also observed by other veterinarians having the care of a large number of horses.

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A NEW ANAPHYLAXY.—Prof. Ch. Richet has presented recently before the Academie des Sciences here new facts relating to anaphylaxy which are of great interest.

He has obtained a magnificent anaphylaxy with no colloid substances. He took for his investigations the white globules of the blood of dogs; no change in the leucocytosis after a first chloroformization; but after a second, a strong leucocytosis. Thus discovering a paradoxical fact which contrasts entirely with what is known of anaphylaxy.

The conclusions of the researches which were made in collaboration with Dr. Lassabliere are: 1. Dogs chloroformed a first time never present leucocytosis either during chloroformization or in the days following; 2. On the contrary, when chloroformed a second time, they exhibit a strong anaphylaxy which begins, the next day after the administration of chloroform, to reach its maximum the eighth day; a lapse of three weeks having been left between the two chloroformizations.

This phenomena can only be explained by the hypothesis of an anaphylaxy of a type unknown to this day, an *indirect anaphylaxy*. Indeed, in this case of preparation and appearance of the anaphylactic accidents, in particular here the leucocytosis, initial manifestation, are due not to the chloroform itself, but to albumines produced by the alteration of the liver and of the kidney under the influence of the chloroform.

It seems then, says Dr. Richet, that anaphylactic substances must be classified into two groups: 1. Those that produce anaphylaxis *immediately*, in a few minutes, by passing directly in the blood; 2. Those that promote later anaphylaxis in bringing albuminoid breaking up, an auto-intoxication harmless the first time and injurious the second; it is the indirect anaphylaxis.

In pathology this indirect form may play a part no less important than the direct, the only one which has been studied till now.

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BIBLIOGRAPHIC ITEMS.—We have received: *Quarterly Bulletin Chicago Veterinary College*, December, 1913. *Agricultural Journal of the Union of South Africa*, December, 1913, January, 1914.

Report of the Veterinary Director General.—Dr. Fred. Torrance, Department of Agriculture of Canada. It forms an illustrated pamphlet of a little over one hundred pages, resuming the work done during the year ending March, 1913, giving detailed statements for each one of the diseases that prevailed during that year, and received the attention of the staff of the Department. Interesting facts relating to glanders and the extensive use of malleine, to hog cholera and the value of the use of serum, to tuberculosis where the test with tuberculine has been extensively applied, of dourine with the methods of diagnosis of Dr. Watson, anthrax, mange, rabies, etc., etc. In the form of appendix, reports are introduced by several of the inspectors of the staff. There are also a few illustrations.—*The Treatment of Tetanus*,

by C. O. McClintock and W. H. Hutchings; *Diagnosis of Dourine by Complement Fixation*, by John R. Mohler, A. Eichhorn and J. N. Buck, of the Bureau of Animal Industry.

A. L.

THE UNITED STATES GOVERNMENT SAVES MONEY
BY INCREASING THE EFFICIENCY OF
ITS VETERINARY SERVICE.

AN OPEN LETTER TO SENATOR CHARLES S. THOMAS, OF
COLORADO.

"It is thought that it will greatly improve the service to give the rank provided in this bill, and that *in that way much money will be saved by virtue of increased efficiency in this service.*"—From the Report of the House Committee on Military Affairs, February 9, 1914. (p. 6, Report 239, 63d Congress, 2d Session).

Ignorance is wasteful; efficiency, carrying with it a sense of responsibility, saves money. The denser the ignorance, the greater the waste; the higher the efficiency, the more money is saved. This, as a business principle, is undebatable. Its wisdom, whether applied to Government business or commercial business, cannot be made plainer by putting it in the form of an adage. Hence, proceeding on this as a principle, the Military Committee of the House of Representatives has recommended that the Army Veterinary Service Bill be made a law.

Senator Charles S. Thomas, of Colorado, a member of the Sub-Committee of the Senate, in whose hands the bill, S. 4331, "To Consolidate the Veterinary Service, U. S. Army, and Increase Its Efficiency," has been placed for consideration, is said to be questioning in his mind the consistency of supporting that bill on the hypothesis that any measure passed which increases the money expenses of the Government by so small an amount as a few picayunes, whatever be the actual gain in stalwart efficiency in its service, is contrary to the Democratic policy of retrenchment. This is retrenchment run stark mad. It is false

economy, misplaced penuriousness which does violence to the sound judgment and truer sense of economy in this instance recommended by the Democratic members of the House Committee on Military Affairs in their statement placed at the head of this letter.

Try to make up a balance sheet, placing in the one column the most insignificantly paltry sum of money which additionally must be charged against the Treasury if the proposed veterinary bill passes; in the other column place what the Government gains. What do you find? The increased cost per annum is \$31,376.26. That we can figure to a nicety and we could have told it to the thousandth part of a mill, if that had been wanted. On the other side of the balance, the complete gain is unfigurable. But it far and away outbalances the few dimes asked for it. The Government proposes to use the military veterinary service as part of that great sanitary machine—the Medical Department; it is to become part of the grand sanitary system of the army. What the economic value of that sanitary system has been to the army the country and the world is well known to Senator Thomas and to everybody else. He knows what it did in the discovery of the cause and means of prevention of yellow fever, of dengue, of hook worm, in the prevention of typhoid fever. Is the sum total of the gain in human health and the prevention of death to be balanced in the fine figuring which carries the money summary to the third or fourth digit beyond the decimal point? Shame on us, if that is the length of our consideration. The Surgeon General of the Army tells Senator Thomas that he proposes to attach the veterinary service to the medical department to enlarge its sanitary work, meaning in two directions, in prevention of the frightful losses in army animals and the prevention of diseases transmissible from animals to man. There are problems to be solved in the department of veterinary medicine involving millions of dollars to this country. The Senator from Colorado is told by the medical experts of the army, who have accomplished so many marvels, that similar performances may be expected with the building up of the veterinary service. As a

plain business proposal, with the gains large for the American people in higher efficiency, in delivery from wasteful inefficiency, the Army Veterinary Service Bill should pass. A cent placed near enough to the eyes will shut out the light of the sun. It is unwise to be blinded by a penny-wise, pound-foolish policy of retrenchment carried to that extremity where it is as unsound in principle as it is unbusiness-like. G. S.

HEARINGS BEGIN ON THE LOBECK BILL.

The REVIEW has urged the support of the profession of the country to H. R. 9292, increasing the standing of the veterinarians in the B. A. I. service, and benefiting them financially. Increased compensation means increased efficiency; so that while our brothers in the B. A. I. service can better provide for their families under the conditions that the passage of this Bill would bring about, the government would also benefit by its passage in increased efficiency and the attraction to the service of high-class men. Dr. S. J. Walkley, secretary of the National Association of Bureau of Animal Industry Employees (whom the executive committee of that body have chosen to represent them at the Nation's Capitol, wrote us from Washington, under date of April 14, that the Bill would come up for a hearing at 10.30 a. m. Monday, April 20, before the House Committee on Agriculture. We sincerely hope that in our next issue we may be able to write some pleasant information as a result of the hearings before that committee. The Buffalo branch of the national B. A. I. organization are sending Prof. V. A. Moore, of Cornell; and the Milwaukee branch are sending Prof. M. P. Ravenel to Washington to appear before the committee in the interest of the measure; and the fact that both of these gentlemen were appointed by Secretary of Agriculture Houston last summer to investigate the meat inspection system in their respective territories and report their impressions to the Secretary of Agriculture, would seem to suggest that their arguments before the House Committee on Agriculture would have some weight. We

understand that their impressions, as expressed to Secretary Houston in the report of their investigations, was to the effect that they considered B. A. I. men very much overworked and underpaid; so it is not difficult to imagine their line of argument before the House Committee on Agriculture. Secretary Walkley will also appear before the committee with a forceful argument for the passage of the Bill; and also Congressman Lobeck, the father of the Bill. And following the work of these gentlemen before this committee, every member of the profession should add his boost with his Congressman and Senator, after the Bill has been reported out of committee. Keep pushing until it becomes law.

THE CONTROL OF BOVINE TUBERCULOSIS IN A DAIRY STATE—SOME STATISTICAL FACTS.

During March, the lay press (or perhaps we should limit it to the New York *Globe*, as we do not remember seeing the articles in other papers) published a series of articles, criticizing the New York State Department of Agriculture to an extent that would tend to shake the public's confidence in that great department of the Empire State, and to cause a feeling of uneasiness (to say the least) on the part of milk consumers; more especially those with families of children where milk forms a very large and very important part of the daily food ration. The REVIEW's confidence, however, was *not* shaken; felt no vibration whatsoever; crediting the wild statements of the critics to a misconception on their part of the policies of the Department of Agriculture, and a misconstruction of their methods of dealing with the momentous question of controlling tuberculosis in a *dairy* state, and not working a hardship upon its citizens by extensively curtailing the milk supply. Our confidence remained unshaken because of our high regard for the Commissioner of Agriculture and the gentlemen of our own profession that are in charge of the Bureau of Veterinary Service of the Department. Had the critics gone to the proper source for their information, or care-

fully investigated the general information that they received, they would not have frightened milk consumers without good cause, nor made public their own lack of information on a subject upon which they were attempting to enlighten the public. Had they understood the principles of the Bang method, and the system of its application by the New York State Department of Agriculture, they would not have horrified the public by making the unqualified statement that diseased cows were being used to supply milk to the old soldiers and inmates of other state institutions mentioned. The following extract from a statement from Commissioner Huson shows that the Department is guided in its work by a law enacted in 1909:

"The law providing for the preservation and segregation of reacting animals that show no physical evidence of disease was enacted in 1909 and has been in successful operation since that time. The same veterinarians that were charged with the duty of putting this law into operation are still engaged in the work of its enforcement. The law is not perfect, and experience has shown the necessity of various amendments. Last year, and again this year, this Department urged before the Legislature the enactment of such amendments to the law as would tend to more completely safeguard the situation. One of these amendments provided that a person must be the actual owner of an animal for at least four months in order to be entitled to indemnity. The purpose and object of this amendment was to provide for the payment of indemnity to the actual dairyman and farmer and prevent, as far as possible, traffic in diseased or suspicious animals. Other amendments no less important were proposed, among them a physical examination of all dairy herds and the removal therefrom and immediate slaughter of all animals that showed such physical evidence of disease as rendered them unfit as a source of milk supply. These amendments failed of passage and some of the men now being heard in criticism were active in opposition to their enactment."

Chief Veterinarian Wills, of the Bureau of Veterinary Service, says that the statement made by the critics that there are

200,000 tuberculous cattle in the state is not indicated by the facts on file in the office of the Department, and that the statement that 40 per cent. of the tuberculous animals in the state are spreaders of the disease is grossly exaggerated. We reproduce below *statistics* relative to the extent of bovine tuberculosis in New York State, taken from a public statement from Dr. Wills, who says: "We believe that these records are the most accurate and complete of any in existence, so far as the State of New York is concerned." And further along he adds: "Any fair-minded person must concede that the bureau of veterinary service of the Department of Agriculture, with the assistance of the veterinary profession and the cattle owner, is to be given some credit for the improvement in conditions."

The following figures show the work of the Veterinary Bureau for the (fiscal) years 1909 to 1913 in tuberculosis work:

	1909-10	1910-11	1911-1912	1912-13
Number tested	14,181	17,909	21,421	18,668
Number reacting	3,029—21%	2,993—19%	4,178—19%	2,891—16%
Number localized cases...	1,685	2,069	2,690	1,940
Number generalized cases..	1,240—42%	824—28% pl.	1,117—29% pl.	581—22% pl.
Number no lesion cases..	104—3%	100—3%	93—2.2% pl.	85—3%
Total indemnity	114,800	154,100	186,965	146,414.75
Number tested privately				
within state		5,993	12,038	20,545
Number reacting		425	473	528
Number held on Bang				
System:				
Owners				276
Regular				407
Total tested in state.....		23,902	33,459	39,213
Total reacted		3,418	4,651	3,419
Percentage reacting		14.3	13.9	8.7

The above figures show that while the number of cows tested in the period of time was increased from year to year, there being over fifteen thousand more cows tested in 1912-13 than there was in 1909-10, the percentage reacting had decreased from 14.3 per cent. to 8.7 per cent. during that period. Any one familiar with the subject of bovine tuberculosis knows that dairy cattle are much more susceptible to it than beef cattle, and in view of the foregoing facts will be willing to commend the Department of Agriculture of the State of New York (dealing as it is practically exclusively with dairy cattle), for the progress that

it has made, rather than condemn it for what it has not been able to accomplish. Its critics probably feeling that complete eradication was the least to be expected. And yet they offered no solution, except the tuberculin test, which the Department thoroughly understands, and fully appreciates the value of. The following, extracted from a public statement made by Consulting Veterinarian to the Department, John F. De Vine, explains the methods employed by the New York State Department of Agriculture in applying the Bang system; which application was misconstrued by the critics as feeding the milk of diseased cows to inmates of state institutions. They also feared contamination from vegetables grown in fields fertilized with manure from the segregated animals, which Dr. De Vine refers to:

"The Bang method, briefly, is that where an owner requests that his herd be tested by the state, or, where the owner has his herd tested by his private veterinarian and a certain number of animals react, and the owner asks for state appraisal, these animals are then carefully examined as to physical evidence of tuberculosis and such as exhibit any clinical evidence of the disease (the positive determination of which is often aided greatly by the fact that they have reacted to the tuberculin test); or, any animals that are otherwise undesirable are immediately slaughtered under the same rules and regulations as are provided for by our federal meat inspection laws. With animals that appear physically sound and possess value as dairy cattle, both as producers and reproducers, an attempt is made to preserve them. They are segregated and placed on the experimental farms. These farms may be the owners, as is the case with several of the big Holstein breeders of the state at present (in which case no indemnity is allowed by the state); or, if the owner does not wish to segregate or keep these animals, they may be placed on one of the state farms or any other farm where the owner from his recognized reliability and ability in stock feeding and dairying is considered a desirable person to prove the feasibility of raising healthy calves from diseased mothers. The milk from these diseased animals is in all cases thoroughly pasteurized, and the

calves raised separate and apart from the diseased animals in the hope of weeding and breeding tuberculosis out of the dairy herds without the great loss of immediate condemnation and slaughter of the excellent dams so affected.

"While it is a known fact, and admitted by every fair-minded person versed on the subject of dairying, that these Bang herds, after being carefully, repeatedly and periodically examined as they are for clinical evidence of tuberculosis (this examination being far more *rigid* and *positive* in condemning than can ordinarily be carried on with animals which have not reacted to the tuberculin test) are much safer as milk producers than is the average dairy herd which has never been subjected to the tuberculin test and which are very irregularly and oftentimes inefficiently examined. In other words, a conscientious dairyman who finally decides both for public health and economical reasons to have his herd tuberculin tested, he having learned of the character of the disease and the necessity and advantage of having a tuberculosis free herd, does so. Oftentimes this very man from his business ability has one of the best appearing and best producing herds in the community. The tuberculin test reveals several diseased animals. Immediately the community begins to talk and these animals are shunned as if they were afflicted with the small-pox. As a matter of fact they are no worse the day after the test than they were the day before, and right across the fence his neighbor John Smith's herd is often many times more dangerous, but nothing is said about John Smith's herd and he continues to ship milk and the public continue to consume it. The conscientious dairyman's cattle are immediately separated, the diseased from the well, and the milk before being used is pasteurized at a sufficient temperature to destroy all living tuberculous organisms. This then is the herd that has been made doubly safe by taking out the clinical cases and by pasteurizing its product; and this is one of the things that the Department is condemned for.

"Another criticism is the danger of the tubercle bacilli in the manure to the public in consuming vegetables grown in the

ground where this fertilizer is used. While there is the same element of danger in this as there is for one to ride in a public conveyance or walk through a public street or a pasture field and touch the grass which cattle have grazed on, still it is entirely too technical and imaginary unless we are to live in sterilized houses or wear antiseptic masks. No less an authority than Dr. W. H. Park, Director of the Department of Health Laboratories, New York City, states that the danger is too remote to be considered and points out and agrees with other authorities that the tubercle bacilli do not multiply outside the living body, and that the organisms passed with the faeces instead of falling into and being nourished by a suitable medium, such as milk, immediately after leaving the body begin to perish, and death and dilution continue both from exposure to air and sunlight and from fermentation due to the myriads of saprophytic bacteria, so that in the matter of a few weeks only a few of the most virulent organisms are still alive. These in all probability would perish on any vegetables that grow above the ground during the growth, due to further exposure to the sunlight. Again the dilution continues when the vegetables consumed in the raw state are washed or peeled. According to our present knowledge, it requires great numbers of the bovine tubercle organisms to produce the disease in the human, such, for instance, as might be contained in a quantity of raw milk. And lastly, it has been conclusively shown that the danger from the transmissibility of the bovine type to the human is during the infant period when great quantities of the organisms are consumed daily with or in a fluid that is favorable to the virulence of the organisms, and at a time when human-kind is susceptible to the disease. It would, therefore, seem since the New York City Health Department and the State Health Department sanction this method of the Agricultural Department's attempt to control tuberculosis without causing a milk famine or ruining the dairy industry, that the policy of the Commissioner of Agriculture should not be so criticised.

"Another criticism, which seems to be often repeated, is that many of the cattle are slaughtered from time to time after being

placed on these Bang farms. This simply adds evidence to the careful way in which the Department keeps in touch with these animals, and any animal that shows the least evidence of the disease advancing, or of any other disease, or becomes unprofitable, is immediately slaughtered and inspected to determine the fitness of the carcass for food, either by a capable veterinarian or a physician who has had special training in this work. When any of the carcasses are passed for food, they are always sold as such to the best possible advantage, every pound being accounted for in the Department's records, the proceeds of which go direct to the State Treasurer and in no way benefit anybody but the taxpayers as a whole.

"I, therefore, fail to see why this criticism is indulged in. Can anyone suggest a more sensible and safe way?

"Statement showing amount of indemnities paid by state on account of condemned tuberculous cattle, also the sums paid into state treasury from receipts from sales of carcasses and hides.

"For the fiscal year ending September 30, 1910:

Indemnity	\$114,800.65
Receipts from sales of carcasses and hides.....	22,104.37
Percentage of cash returns.....	19-25/100

"For the fiscal year ending September 30, 1911:

Indemnity	\$154,100.43
Receipts from sales of carcasses and hides.....	23,881.57
Percentage of cash returns.....	15-49/100

"For the fiscal year ending September 30, 1912:

Indemnity	\$186,965.80
Receipts from sales of carcasses and hides.....	34,231.34
Percentage of cash returns.....	18-3/10

"For the fiscal year ending September 30, 1913:

Indemnity	\$146,414.75
Receipts from sales of carcasses and hides.....	36,67'.73
Percentage of cash returns.....	25-5/100

"Increase in percentage of cash returns for the year ending September 30, 1913, over previous year, 36-88/100 per cent."

While the assumption that the criticism of the New York State Department of Agriculture through the public press may have gone forth through the country and been read by veterinarians, who would naturally be desirous of knowing the facts, would be sufficient reason for our reference to it, our real reason is that the problem that New York State is attempting to solve, *i. e.*, the most economic method of controlling bovine tuberculosis in a dairy state, is not an easy one, and any suggestions that will help the Department to improve its system, we feel sure, will be welcomed. The criticism referred to, while wholesale, carried with it no suggestions to help them to improve their system. That must come from those who know something about that which they are criticising. It must come from the veterinary profession; and we are sure that if any members of the veterinary profession who have been pondering these questions (and many there are who have made a life study of them) have any criticisms to make on New York State's system of dealing with the control of bovine tuberculosis, they will be gratefully received by those in charge of that important work in that commonwealth. Honest commendation is equally helpful; as it is in any cause.

MONEY GIVEN FOR STUDY OF ANIMAL DISEASES.

ROCKEFELLER INSTITUTE TAKES UP CHOLERA AND TUBERCULOSIS.

The danger to health and the enormous economic loss resulting from animal diseases, such as hog cholera and tuberculosis, have at last been recognized by great business and financial interests as a matter affecting the economic welfare of the country. The government has long realized them, and the trades affected have long suffered from them, but their momentousness has never until now been properly realized by the country at large.

That a crisis has now been reached which has forced attention is indicated by the announcement this week that John D. Rockefeller has given a million dollars for the study and eradication of

these diseases, and that James J. Hill has pledged \$50,000 for the study of hog cholera, with more to follow.

The Rockefeller Institute for Medical Research, one of the greatest scientific institutions in the world, has received from John D. Rockefeller \$1,000,000 as an addition to its general endowment for the purpose of organizing a department for the study of animal diseases. It announced also a pledge of \$50,000 from James J. Hill to aid in the study of hog cholera.

Heretofore the Rockefeller Institute has confined its investigations to research work in the fundamental problems of biological science and to investigations in the field of human diseases. The formal announcement of the opening in the near future of its new department contains this statement of the scope of the inquiry:

"Animal diseases are important, not only because of their economic significance but because of their close relationship to human diseases. The loss to the country entailed by animal diseases is to be calculated not only in terms of animals destroyed but with reference to the discouraging effects on enterprise in animal husbandry which such epidemics as the recent epidemic of the hog cholera always exert. It has been estimated that in the northwest alone hog cholera has killed \$60,000,000 worth of swine during the last year.

"In the history of medical science, the work of Pasteur on anthrax, and the more recent observations in this country on Texas fever in cattle, which opened the door to present knowledge concerning insect carriers of malaria, yellow fever and other diseases are conspicuous illustrations of the value on studies of animal diseases."

It was said at the office of the Institute that no announcement will be made as to where the animal research work will be carried on until after the organization of the department is completed.

MAY STUDY BOVINE TUBERCULOSIS ALSO.

It is understood that one of the big features of the work of the new department will be a study of cattle tuberculosis, with

which so many animals are affected throughout the country. Bovine tuberculosis is often contracted by persons through the bacilli in milk that is not properly pasteurized and its danger through other dairy products, like butter and cheese, is also recognized. Some states pay thousands of dollars annually to cattle raisers and farmers for tuberculous cows that are condemned and killed by order of inspectors of the State Agricultural Department. But the meat industry suffers losses running into the millions through this same cause for which it receives no recompense whatever.

The problem of hog cholera is one that is confronting the meat industry with as much danger as the scourge of animal tuberculosis ever did. What these diseases have cost the industry will never be accurately reckoned. The losses are almost unthinkable. The trade believes it to be high time that the best thought and effort obtainable be devoted to a campaign against these diseases. The announcement that the Rockefeller Institute has taken up the work will be hailed with gratification.—Quotations from *The National Provisioner* of April 4, 1914.

THE EUROPEAN TOUR AND THE TENTH INTERNATIONAL VETERINARY CONGRESS.

When this issue goes into the mail, but six weeks will remain to the time when good-byes will be sung out from the steamer, and handkerchiefs will be fluttering from the pier as a merry body of veterinarians and their kinsfolk set off for a tour of Europe, with the Tenth International Veterinary Congress, London, as their objective point, under the most auspicious condition imaginable. For June 13th is the day that the vessel carrying that distinguished cargo will steam out of New York Harbor. It is therefore imperative that any who expect to be of that merry party, and have not yet signified their intentions to Dr. Eichhorn to that effect, do so at once; thus insuring to themselves and to the entire party more commodious quarters on the steamship, and materially aid in the making of arrangements for the com-

fort of the party en route. We have said this before, and will promise not to repeat it again, but feel at this time that another word may not be amiss, as Dr. Eichhorn has received several letters from prominent veterinarians, veterinary institutions and veterinary societies abroad, inquiring as to the approximate number of the American party, so that they may arrange accordingly in their efforts to make the trip more enjoyable and more profitable by their co-operation. And we will also mention again, and for the last time, the desirability of Americans becoming members of the Congress, even though they cannot attend this coming meeting. This membership, which only costs \$5, indicates the interest taken in international affairs by American veterinarians, and insures to them the publications of the Congress, which are worth much more than that sum. Send your money to Dr. Adolph Eichhorn, Department of Agriculture, Washington, D. C., and he will fix the matter of membership up for you. We are also recently in receipt of a list of some forty-six London hotels, from Sir Stewart Stockman, but have refrained from publishing them for the reason that the management of the American touring party have selected St. Ermin's Hotel, St. James' Park, as the London headquarters of the American party, and the other hotels can therefore have no special interest for them. The location of the St. Ermin's is ideal, being only three minutes' walk from the meeting place of the Congress, and very convenient to all the important public buildings, art galleries, etc. The prices in this great hostelry are moderate, as rooms with light and attendants may be had from 5 shillings up. Breakfast, 2 shillings; luncheon, 2 shillings; and dinner, 5 shillings, in the hotel, and there are any number of restaurants and eating places all around it. To have reservations made for you in hotel headquarters with all your friends, Dr. Eichhorn must hear from you as soon as possible. For while you do not get to London until August 2d or 3d, the management want all their arrangements completed before the party sails from New York June 13th. There may be a few American veterinarians who will not find it possible to take all the time required for the European tour, but who ex-

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THE MULE "INFERNAL BUT ETERNAL."

The mule has a champion—and a powerful one. It is no less than Henry Watterson, who in his *Louisville Courier-Journal* takes up the cudgels for that much abused animal. "Marse Henry" denies vigorously an assertion in the *Army and Navy Journal* that the supply of mules is diminishing. He shows that while the horse is losing his hold, the mule is emphatically holding his own, and gives good reasons for this fact, such as these:

"In war the mule plays with high credit the role of Gunga

Din. He is bullyragged. He is blasphemed. He is belabored. But he is always on hand when needed, and he is always needed. In peace he is sportive. His humor is sometimes mistaken for spitefulness when he kicks a well-meaning farmer into a protracted sojourn at a hospital or sends his soul skywinding into the hereafter with his body not far behind. But when it comes to pulling a load, uphill or on the level, subsisting upon a limited menu, and starving the veterinarian, he puts it all over his handsomer and more aristocratic cousin, the horse."

Not content with this eulogium of the mule, the eloquent Louisvillian soars further into the empyrean in laudation of his beloved subject, traces his ancestry and prophesies for him a glowing future, thus:

"There is still plenty of work for the mule to do. It is his proud distinction to cost almost as much as a small automobile. He was perhaps 7,000 years old when the automobile was invented. He is built on the original model. He has the same tendency to backfire that made it a risky business to start him when Alexander set out to cross the Indus, when Tamerlane crossed the Ganges, when Hannibal crossed the Alps, when Charles Martel double-crossed the Moors, when Washington crossed the Delaware and when the farmer boy tried to cross a swollen creek in the last freshet."

The truth is, the mule is considerable of an animal. No one who has experience with him will doubt, as "Marse Henry" says, "Although he is sometimes infernal, the mule is eternal."—From the *Chicago Inter Ocean*.

REPORT OF SEVENTEENTH ANNUAL MEETING OF THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION.—This report, covering over 250 pages, tells the story of the great meeting in Chicago, December 2d, 3d and 4th, 1913, and impresses one with the wonderful growth both in numerical strength and sanitary importance of that organization during the last few years. Always characterized by its earnestness and activity, it has recently become a power in the field of sanitation second only to the American Veterinary Medical Association; and a close second at that. Its effort to effect pure animal food products is amongst the noblest work of man; and Secretary Ferguson's remarks on the injection of hog cholera serum in the ham of the live hog are surely *a propos*.

ORIGINAL ARTICLES.

THE RELATION OF VACCINE THERAPY TO VETERINARY PRACTICE.*

BY R. E. SPLINE, M.D., NEW YORK.

(Continued from April issue.)

BACTERIAL VACCINES.—Bacterial vaccines were introduced in 1902 by Sir A. E. Wright, of London, who demonstrated that the phagocytic power of leucocytes is much greater when the leucocytes are suspended in a blood-serum obtained from previously immunized animals than when suspended in normal blood-serum; and further, that the phagocytic power of the leucocytes is dependent upon the presence in the blood-serum of certain substances having a sensitizing effect on the invading organisms. These substances were called "opsonins" by Wright, who concluded that they are naturally increased during the process of immunity; and he discovered that they may be increased by injecting bacterial vaccines.

Definition.—Bacterial vaccines are suspensions in physiological salt solution of killed pathogenic bacteria. The suspensions are sterilized and accurately standardized to contain a definite number of bacteria in each cubic centimeter.

Therapeutic Action.—The therapeutic value of the bacterial vaccines is dependent upon *their stimulating action on the body cells of the patient; thereby producing various antibodies—agglutinins, bacteriolysins, opsonins, precipitins, and other anti-bacterial substances—and leading to a state of active immunity, which in some cases may last for a number of years.*

*Read by invitation before the Wisconsin State Veterinary Society at Milwaukee, February 10, 1914.

From the Lederle Antitoxin Laboratories, New York.

Vaccines vs. Serums.—Therapeutic serums are fluids containing *antibodies already formed*, and are injected into the circulation to supply anti-bacterial elements without stimulating the body cells to the production of these substances. Hence, *in the use of serums*, the antibodies formed in the body cells of the horse or other animal are supplied to the patient; and a condition of *passive immunity is established*, lasting only a few weeks. Therefore, serums differ from *bacterial vaccines*; the latter *confer active immunity and contain no antibodies*.

Preparation.—Bacterial vaccines are prepared by the Lederle Antitoxin Laboratories from cultures of pathogenic bacteria which have been grown upon suitable media under the most favorable conditions. *Several strains of the respective organisms are used*; for it has been demonstrated clinically, as well as in the laboratory, that different cultures of the same organism may vary widely in biochemic properties; and that most vaccines should be polyvalent in order to possess the greatest efficiency. *Polyvalent* means that the suspension contains several cultures of the same species of bacteria—that is, *several "strains" of the organism are used*—the cultures being obtained from many different sources of infection in which that species of organism is found. *All of the bacterial vaccines prepared in the Lederle Antitoxin Laboratories are polyvalent.*

The bacterial cultures are washed off with physiological salt solution and thoroughly shaken to separate the organisms; the bacterial suspension is subjected to a careful count; the organisms are killed by heating the suspension and by the addition, after cooling, of 0.25 per cent. trikresol. The suspension is then diluted with sterile physiological salt solution containing 0.25 per cent. trikresol until each cubic centimeter contains the desired number of bacteria.

Dosage.—Wright expressed the opinion that, by following the opsonic curve, indications might be obtained for the introduction of vaccines both as regards the size of the dose and the frequency of the injections. Suffice it to say, however, that the opsonic index unfortunately has not fulfilled those expectations

with which it was first greeted; and that any attempts at vaccine treatment must still be made upon a more or less empirical basis and with no more definite and accurate methods of dosage and frequency of injection than is afforded by clinical symptoms. But even so, there can be no doubt that a certain amount of good may be accomplished; how much, it is as yet impossible to say. So much depends upon individual cases, the personal factor of the observer, etc., that conclusions could only be drawn with great care. As yet, we do not know enough of what may or may not be accomplished to warrant any dogmatic statement.

The general rule in vaccine therapy is to *begin with small doses* and progressively increase; immunity being more effectively produced by repeated injections of gradually increasing doses than by a single injection of a large dose. At the same time the clinical effects in the individual case must be made the basis for the size and frequency of the doses; for the dosage is influenced by the nature of the infection, and also by the individual susceptibility. Should no improvement be noted, the size of the dose may be increased, or the intervals shortened, or both. If a pronounced clinical reaction occurs—characterized by fever and aggravation of local symptoms—it indicates that the dose has been too large; and the next injection should be smaller. We have sufficient evidence, however, to show that much larger doses than the maximum quantities now recommended may be given in most cases.

The amount of vaccine required varies according to the age and personal characteristics of the patient; and the type, duration, extent and severity of the infection. It is important to bear in mind, however, that the packages containing six different dilutions, as marketed by most laboratories, do not in any sense constitute a complete treatment. It is impossible to prepare any six graduated doses which would meet the conditions of every case; some cases might require 12 to 15 doses, while 4 or 5 might suffice for others.

As a general rule, *the intervals between the doses in acute infections* vary from one to three days. After the acute symptoms have subsided—as shown by a drop in the temperature and by

other signs of improvement—the intervals may vary from two to five days. In sub-acute and chronic infections, the vaccine should be given every three to seven days; the doses being increased according to the clinical symptoms.

Autogenous vs. Stock Vaccines.—A great deal of discussion has arisen regarding the question as to whether it is advisable to use autogenous vaccines, that is vaccines that are prepared from the cultures of the bacteria obtained from the patient; or whether it is better to make use of stock vaccines prepared from cultures of the organism causing the infection, but not derived from the particular individual to be treated. As long as we know so little of what vaccines may accomplish, it is clear that our clinical knowledge is not sufficient to decide such a question. We can only speak theoretically, and theoretically we must admit the existence of many strains of a given type of organism and also the possibility of individual differences in the organism. Upon this basis autogenous vaccines would appear to be preferable to stock vaccines, since autogenous cultures comply with the scientific requirements of a vaccine. From a practical standpoint, however, stock vaccines are more satisfactory to use for various reasons: (1) It is frequently impossible to prepare an autogenous vaccine for lack of proper facilities. (2) It requires several days to prepare an autogenous vaccine and this necessitates loss of valuable time in the treatment. (3) Since it has been demonstrated that different cultures of the same species of organism vary widely in biochemic properties, it is obvious that a polyvalent stock vaccine will produce a high grade of immunity. (4) An autogenous vaccine adds materially to the cost of an otherwise inexpensive treatment.

USE OF VACCINES AND SERUMS IN VETERINARY PRACTICE.—The practical application of vaccines and serums in veterinary practice may properly be considered under three headings: Those used for prophylactic purposes; those employed as therapeutic measures; and those used as diagnostic agents.

Prophylactic Vaccines.—The principle of prophylactic inoculation is best illustrated by reference to human medicine. When

and how the discovery was made that the virulence of smallpox is greatly diminished by the introduction of virus through the skin is not known; but the principle was evidently extensively utilized in Turkey for prophylactic purposes early in the 18th century. Led by the popular belief, which was prevalent in Gloucestershire during the latter half of the 18th century, that individuals who had accidentally become infected by cowpox were thereby protected against smallpox, Jenner put this idea to a test in 1796. To this end, he inoculated a healthy boy 8 years old with material taken from a cowpox vesicle on the hand of a dairymaid and, a couple of months later, showed by inoculation with cowpox virus that the child was actually immune. After this, vaccination was extensively practiced in different European countries and introduced into America. The source of material for a long time was obtained from cows that had developed cowpox; in some instances from horses affected with grease, the affections having been shown to be identical.

RABIES.—While the actual principle underlying the preventive vaccination against smallpox was scarcely recognized by Jenner and his contemporaries, their work nevertheless constitutes the basis of all modern vaccine work. To it may be directly attributed the successful preventive treatment of another prevalent disease, the pathogenic agent of which has not yet been isolated, namely, rabies.

We owe the discovery of this treatment to the genius of Pasteur; and to him undoubtedly belongs the credit for having first recognized the fact that, by the use of suitable attenuated virus, full protection may be afforded against the corresponding virulent affection. In Jenner's case, nature had performed the experiment for him; but Pasteur was the first who purposely employed animal experiments to demonstrate the principle in question.

The idea underlying Pasteur's Antirabic Treatment is to immunize the bitten animal within the period of time that the actual disease requires for its development. To accomplish this, it was necessary to so change the nature of the virus that the incubation

period following its injection would be materially shorter than that of the actual disease. This was accomplished by passing the natural or "street virus" through a series of 50 rabbits, when its period of incubation was found to be reduced to 6 or 8 days. Further passage does not change it; and such virus, which no longer produces symptoms of the furious type of rabies in dogs or guinea-pigs, but merely the paralytic type, is now termed "fixed virus." Pasteur then found that the virulence of the virus can be still further diminished by desiccation and that after 12 to 14 days it is lost altogether. The plan of treatment is to inoculate the animal on successive days with material of increasing virulence, beginning with that which is altogether innocuous. The mortality from rabies, which formerly ranged between 14 per cent. and 16 per cent. has been reduced to about 1 per cent. under Pasteur's vaccine treatment.

BLACKLEG.—A very valuable and practical method of vaccination against blackleg or quarter ill was devised by Arloing, Cornevin and Thomas in 1879. By this method, a vaccine is prepared from diseased muscles by attenuating the virus by means of different degrees of heat. One portion is heated at 100° C., the other at 90° C., for 6 hours. That portion prepared at the high temperature makes the first or weaker vaccine, while that prepared at the lower temperature is the second or stronger one. The high temperatures attenuate the virulence of the virus. The spores, however, remain capable of germinating, but are not capable of exerting their pathogenic influence. The spores germinate and multiply slowly, so that little by little the newly produced virus immunizes the tissues. The immunity becomes positive in 8 to 10 days after the second vaccination.

The practical value of the protective vaccination has already been definitely established, and the immunity obtained persists for 3 to 12 months. In 1880, Arloing, Cornevin and Thomas subjected 13 head of cattle to protective vaccination before a Commission at Chaumont. When these cattle were later inoculated with virulent material, they all remained healthy; while out of 12 non-vaccinated animals 11 acquired blackleg as the result of

a similar inoculation and 9 of them died. Protective vaccination is now practiced with good results in those districts where the disease usually appears as an epizootic. Vaccination has reduced the number of cases so that the disease is only one-twelfth as prevalent as formerly.

Experiments, conducted by Kitt, showed that, by heating the diseased muscle for six hours at 97° C., a suitable vaccine could be obtained which would produce lasting immunity by one injection. This method of vaccination is especially to be recommended, and has been used in the United States since 1897. The best seasons for using the protective vaccination are the spring and fall, but this may be regulated by local circumstances and by an observation of the time of year when previous outbreaks occurred. In the case of young stock, it is advisable to give a second vaccination in 3 months.

ANTHRAX.—In 1881, Pasteur conclusively established the fact that anthrax bacilli, when grown at a temperature of 42.5° C., will continue to actively multiply for a time, but no longer form spores. Further, he proved that the bacilli, when attenuated to a certain degree, will retain this degree of virulence if their cultivation is continued at body temperature. Finally, when the attenuated organisms are grown at 37° C., they may again form spores whose degree of attenuation will be that of the bacilli in which they develop: in this way, the virulence is fixed and may be indefinitely perpetuated. Upon this experimental work is based the practical method of protective inoculation against anthrax, worked out by Pasteur with the co-operation of Roux and Chamberland.

The vaccine is prepared by growing the bacilli in bouillon at a temperature of 42.5° C. After 12 days' growth, the cultures are attenuated to such a degree that they will kill guinea-pigs but not rabbits. Such an attenuated culture, when grown at 37° C., represents the second or stronger vaccine. After 24 days' growth at 42.5° C., the cultures are so attenuated that they will kill white mice but not guinea-pigs. Such an attenuated culture, when grown at 37° C., represents the first or weaker vaccine. Protective inoculation is carried out by the subcutane-

ous injection of the weaker vaccine, followed in 12 days by an injection of the stronger vaccine.

The immunization is based upon the principle that the first injection materially reduces the natural susceptibility of the animal, so that it will withstand without injury the second inoculation with the stronger vaccine. The immunity becomes positive in about 10 to 12 days after the second inoculation and persists for about one year. The effectiveness of the vaccine has been proved by Pasteur through experiments carried out before a Commission at Pouilly-le-Fort. Of 50 sheep, 25 were vaccinated with his two vaccines, and two weeks after the second vaccination they were inoculated with anthrax material, together with the 25 control animals. The results showed that inside of two days all of the 25 control animals died of anthrax, while all of the 25 vaccinated sheep remained alive. The results obtained from a large number of cases indicate that the death rate may be reduced from more than 90 per cent. to less than 5 per cent. if vaccination is practiced early.

CANINE DISTEMPER.—Canine Distemper is the most destructive and widespread infectious disease with which dogs are affected. The disease is inevitable for young dogs—especially highly bred and valuable animals—the mortality among some breeds reaching 70 to 90 per cent. It exists in all countries and occurs at any season of the year, although the spring and fall months are the most favorable for its production.

The etiology of this disease has occupied the attention of a number of bacteriologists since the time of Pasteur. Ferry (1910) and McGowan (1911) independently isolated the same bacillus (*B. bronchisepticus*), which was claimed to be the primary etiologic factor in the disease. The extensive investigations carried out by Torrey and Rahe (1913) in the Department of Experimental Pathology of the Loomis Laboratory, Cornell University Medical School, covering a period of 2½ years, have demonstrated that the *B. bronchisepticus* is the essential and specific factor of canine distemper.

Canine Distemper Prophylactic is used as an immunizing

agent against canine distemper. It is advisable to give three doses at intervals at 3 to 5 days and at least one month before probable exposure, in order to produce a thorough immunization. The prophylactic vaccine may be given at any time, provided symptoms of the disease have not appeared. If the vaccine is used after exposure and the dog contracts the disease, the severity of the symptoms will be lessened and the duration of the disease shortened. However, in vaccinating animals that are known to have been exposed, it is advisable to consider such animals as already infected, and to use the vaccine as outlined under Canine Distemper Treatment. The initial prophylactic dose contains 350 million of the specific organisms; the second dose 700 million, and the third dose 1,050 million.

EQUINE INFLUENZA.—Equine Influenza has been known from earliest times under various names (equine contagious pleuro-pneumonia, stable pneumonia, shipping fever, catarrhal fever, typhoid fever, etc.), and its infectious nature has been recognized since the second half of the last century. The term "influenza" has been used since the beginning of the last century for all acute febrile affections of horses that spread rapidly and which have a pronounced miasmatic-contagious character.

Schütz (1887) undertook extensive bacteriological experiments to establish the nature of the disease, and indicated a diplococcus as the causative factor. This bacterium was later proven to be a streptococcus closely related to the streptococcus of strangles. It has been a much debated question as to whether this organism is found solely in strangles; and a review of the bacteriological investigations in strangles, influenza and contagious-pneumonia indicates that this organism predominates in these conditions. The very fact that contagious pneumonia and strangles so frequently occur side by side in the same stable, and are so often found following so closely symptoms of influenza that in the initial stage a differential diagnosis is often extremely difficult or impossible, has led the majority of observers to believe that these diseases are closely related.

Ferry (1912) isolated a streptococcus in pure culture from

the lower trachea in a case of typical influenza, as found in various stock yards and sales stables. He also obtained this streptococcus from cultures taken from the blood of horses suffering with this disease. The cultural characteristics of this micro-organism are apparently identical with the streptococcus of strangles.

There is considerable evidence that these streptococci are alike, and they are apparently always found in influenza, strangles and contagious pneumonia. Moreover, there is little doubt that they are responsible for the severe symptoms manifested in these diseases.

There is very convincing evidence that the organisms, isolated by Schütz and Ferry, are only secondary invaders which accompany or complicate the disease; for, the very excellent work of Gaffky indicates that the primary causative factor of equine influenza is undoubtedly a protozoön which can be classed among the filterable viruses. In view of this fact, it cannot be expected that any positive immunity will result from the use of a bacterial vaccine. Nevertheless, it is quite certain that, without the secondary infection, the course of the disease is very mild. The vaccine, used for prophylaxis and treatment of the disease, is, therefore, entirely logical; for it protects animals from the more severe symptoms of the disease which are due to these secondary invading organisms.

Equine Influenza Prophylactic is used as an immunizing agent to prevent the complications which usually accompany equine influenza; such as fatty degeneration of the heart muscle, acute nephritis, intestinal catarrh, pleuro-pneumonia and septicemia.

It is always advisable to give 3 doses at intervals of 3 to 5 days for a thorough immunization. If the vaccine is used after exposure and the horse contracts the disease, the severity of the symptoms will be lessened and the duration of the disease shortened. However, in vaccinating animals that are known to have been exposed, it is advisable to consider such animals as already infected, and to use the vaccine as outlined under Equine Influenza.

enza Treatment. The initial prophylactic dose contains 1,200 million of the combined organisms; the second dose, 3,600 million; and the third dose, 6,000 million.

CONTAGIOUS ABORTION.—The tendency toward natural immunity of cattle infected with contagious abortion has raised the question of the production of artificial immunity by various methods. Bang's investigations along this line indicate the possibility of securing such immunization in cattle as well as in sheep and goats. Mohler and Traum have been conducting a number of experiments on 5 large dairy herds in an endeavor to find a suitable biologic product for immunization and control of this disease. Suspensions of the Bang bacillus, killed by heating or carbolic acid, were injected. Over 250 head of cattle have been thus treated from 3 to 5 times with the product prepared from one strain of the organism. Since the different strains have been found to vary somewhat, other experiments have been conducted with suspensions made from a number of the most virulent strains. The outlook for prophylactic treatment along this line is somewhat encouraging, but a definite decision on the value of this line of vaccination must be deferred until the completed investigations of various workers are reported.

Prophylactic Serums.—The importance to the veterinarian of three diseases, in which prophylactic inoculation is carried out by means of serums instead of vaccines, necessitates a few words concerning tetanus, hog cholera and strangles.

TETANUS.—The early work of Behring and Kitasato on the immunization of rabbits, and the experiments of Tizzoni and Catani on mice and rats, formed the basis of the serum immunization and serum therapy for tetanus. The serum of horses is now exclusively used for this purpose, since Schultz found that horses and sheep may also be successfully immunized against tetanus and produce a potent, immune serum. Immunization is advisable and indicated in all cases in which tetanus is feared within a short time. Such a possibility exists particularly for contusions, which have become contaminated with dirt or manure; also, whenever tetanus is frequently observed, in certain

localities, to follow operations, including castration, docking of the tail, operations for umbilical hernia, various skin injuries, etc., and when, during the operation, careful asepsis cannot be carried out. Recent work in the field of medicine by Ashhurst and John have clearly demonstrated the fallacy of employing tetanus antitoxin subcutaneously. Their work has decisively demonstrated that the antitoxin should be administered in all cases both intraspinously and intravenously; and, further, that whenever possible, injection of antitoxin should be made in the sheath of the nerve supplying the affected part.

HOG CHOLERA.—One can only hope to secure practical results from a method of immunization against hog cholera which will afford protection against primary infection with the filterable cholera virus. After the demonstration of the latest facts concerning the etiology of the disease, by establishing the virulence of the filtered tissue-fluids of affected animals, experiments were undertaken to work out a suitable method of immunization; and already they have led to valuable results. The idea of using serum from hogs, which recovered from cholera, for immunizing purposes was first utilized by Preisz in 1897. According to the experiments of Dorset, McBryde, Niles and many others, hogs which acquire an immunity from an infection of hog cholera, when injected with virulent blood, produce a serum which protects susceptible hogs for at least 3 weeks against infection. The results in practice have proven very satisfactory; for, by the aid of this method, it is possible to considerably reduce the loss in herds which have been affected, and in many cases to check the outbreak abruptly. It is advisable to treat all herds, which are threatened by the infection, with the immune serum, and especially those in which the disease has already appeared. Moreover, the drove should be retained in the same place until the infection is eradicated. In case the disease appears again in the same herd, it is advisable to repeat the injection with immune serum.

STRANGLES.—Antistreptococcus Serum prepared by the use of the streptococcus equi is being used with encouraging results for the prophylaxis of strangles. For this purpose not less than 50 to 100 c.c. of the serum should be used.

Therapeutic Vaccines.—The list of diseases in which vaccines may be used from a therapeutic standpoint is a long one, yet the actual number of different types of diseases is more or less limited.

SUPPURATIONS.—The ever-present staphylococcus is responsible either primarily or secondarily for numerous suppurative conditions. Bacteriological examination has revealed the fact that these infections are of a mixed nature, the streptococcus being almost always associated with the staphylococcus, and, many times, the colon bacillus is also present. The use of a mixed bacterial vaccine containing the staphylococcus, streptococcus and colon bacillus finds its application in the treatment of infected wounds, including open joints, nail punctures, wire cuts and various surgical wounds; as well as abscesses, navel ill, poll evil, fistulous withers, etc. Thomason reports the cure of navel ill, fistulous withers and poll evil by the use of mixed vaccines. In treating suppurative conditions with vaccines, however, it is necessary to employ deep incisions and passive hypermia, in order to bring the vaccine into the focus of the disease.

CANINE DISTEMPER.—According to the work of Torrey and Rahe, the bacillus bronchisepticus is the infective agent essential for the transmission of canine distemper; but certain characteristic symptoms of the disease are due to secondary infection by other micro-organisms, notably the streptococcus and the staphylococcus. In treating the disease, therefore, it is essential that a vaccine composed of all of these organisms be used; and the treatment should be begun as soon as possible after the diagnosis has been made. Reports from a large number of veterinarians indicate that Canine Distemper Treatment is of distinct service if used early in the disease.

Animals, that are known to have been exposed to canine distemper, should be considered as already infected; and it is advisable not to vaccinate such animals with the prophylactic vaccine, but to use the Canine Distemper Treatment which has been found to produce better results in such cases.

A safe initial dose seems to be 175 million of the combined

organisms—very small or very young dogs receiving one-half of this amount—each succeeding dose should be increased by 175 million of the combined organisms. The doses are usually given at 2 to 3 day intervals, depending upon the reaction and general condition of the animal. Treatment should be begun as soon as possible after the diagnosis has been made.

EQUINE INFLUENZA.—Bacteriological investigations indicate that the streptococcus is the predominating organism in strangles, influenza and contagious pneumonia. These closely allied diseases are now being treated with a vaccine composed primarily of streptococci, staphylococci and pneumococci, obtained from these diseases. A proper dosage of equine influenza treatment, which is a polyvalent vaccine, depends somewhat upon the indications in each case. A safe initial dose seems to be 300 million gradually increased according to the symptoms; colts receiving one-half of the adult dose.

Animals, that are known to have been exposed to equine influenza, should be considered as already infected; and it is advisable not to vaccinate such animals with the prophylactic vaccine, but to use the Equine Influenza Treatment which has been found to produce better results in such cases.

PNEUMONIA.—Numerous reports show that the course of croupous pneumonia is favorably influenced by the use of pneumonia vaccine, composed of pneumococci, streptococci and staphylococci. In delayed resolution after pneumonia, it is undoubtedly of great benefit. The initial dose is 500 to 1,000 million progressively increased.

WHITE SCOURS AND ENTERITIS.—Extensive bacteriological studies of Jensen, Poels, Joest and others have shown that white scours of sucklings is caused by the bacillus coli communis. A polyvalent colon vaccine has been used with very favorable results by many German investigators. This product is also very useful in treating enteritis and numerous other associated diseases of the abdominal organs.

Therapeutic Serums.—Before leaving the subject of therapeutics, mention must be made of tetanus antitoxin and anti-streptococcus serum.

If tetanus antitoxin is employed intraspinaly and intravenously, many valuable animals can be saved and the expense of the treatment materially reduced.

Antistreptococcus serum prepared by the use of the streptococcus equi, is being used with encouraging results by many foreign investigators in the treatment of strangles, pneumonia, purpura hemorrhagica and septicaemia. Many reports have been published in which the use of this serum has been followed by good results in strangles, influenza, bronchitis and pneumonia. In this country, Norton has reported the successful treatment of strangles and influenza by the use of antistreptococcus serum.

Diagnostic Agents.

TUBERCULIN.—One of the most serious problems concerning the live stock industry is the increasing prevalence of tuberculosis among cattle and hogs. Tuberculosis often develops so insidiously that a long period often elapses before any symptoms are shown; and yet, during this time, the infected animal may communicate the disease to others in the herd. Tuberculous infection produces certain changes in the animal body, as a result of which it reacts to the second infection, or to the injection of the toxins of the tubercle bacillus, in a different manner than the body of an animal which has not been infected. This condition has been variously styled "allergy," "hypersensitiveness" and "anaphylaxis." Anaphylaxis manifests itself in pronounced inflammatory reaction, following the administration of small quantities of toxins which would have no effect on healthy animals. This hypersensitiveness is particularly evident with respect to the tuberculin which Koch prepared from glycerin bouillon cultures. Practical experience and observations have confirmed Koch's declaration that, on account of its specific action on the tuberculous animal, tuberculin is admirably adapted as a diagnostic agent. Tuberculin is the bacteria-free filtrate containing the metabolic products of the tubercle bacilli grown on glycerinated bouillon, and can be used for detecting the presence of tuberculosis in cattle and other animals. When injected into a tubercu-

lous animal it produces a rise in temperature, but not when injected into a healthy animal. The injections may be given subcutaneously in the neck, about midway between head and shoulder.

MALLEIN.—Infection with glanders produces a peculiar anaphylactic condition of the animal body, similar to that observed in tuberculosis. This condition manifests itself by an increased susceptibility to the toxins of the bacillus mallei, which is the organism that causes glanders. This hypersensitiveness is utilized for diagnostic purposes by administering the toxin of the glanders bacillus to the suspected animals, and the resulting reaction is considered as an index of the presence or absence of infection. Mallein is the toxic substance produced by the bacillus mallei when cultivated in the local glycerinated medium.

The diagnostic value of the mallein reaction has been confirmed by the practical experience of the last two decades; and, at the present time, it has been firmly established that mallein is an extremely delicate and reliable agent for the diagnosis of glanders.

In performing the test, ophthalmic mallein is by far the best preparation to use. It is the most sensitive; gives the most accurate results; is absolutely reliable; and is much more convenient to apply than is the subcutaneous test.

CONCLUSIONS.

In conclusion we desire to emphasize the following points:

(1) The veterinary biologic literature now on record is very meagre; and veterinarians ought to encourage the building of a reliable literature by reporting and publishing the results—both negative and positive—of vaccine therapy.

(2) In using vaccines for therapeutic purposes, one package containing 5 or 6 doses must not be considered a complete treatment; some cases may require 15 or more doses, while others may be benefited by 4 or 5. On the other hand, one package of the prophylactic vaccines does constitute a complete treatment.

(3) In vaccine therapy, every case must be individually

studied—just as when administering drugs—and the size, number, and frequency of doses must be adapted to the needs of the individual case.

(4) Furthermore, in treating disease with a vaccine, the necessary medical and surgical measures must not be neglected; for reliance should not be placed solely on the action of the vaccine.

(5) Vaccines have failed in many instances to give the desired results, because they were given in cases unsuited to vaccine therapy. Vaccines are specific in their action, and have doubtless often been used without correct bacteriologic diagnosis.

(6) Vaccines must not be expected to reconstruct tissues that have been destroyed by pathogenic organisms. Vaccines are not panaceas, nor a substitute for the veterinarian; but they do serve as a valuable adjunct in the therapeutic treatment of diseases.

(7) Vaccines play a most important rôle in veterinary practice in the prophylaxis of diseases.

(8) To be effective, vaccines must be timely and intelligently administered by a trained veterinarian.

(9) In order to secure the best possible results from vaccine therapy, the veterinarian should keep in touch with a scientific laboratory where the pathogenic organisms can be studied. The veterinarian and the laboratory must work together in the development of biologic therapy which, it is believed, is destined to revolutionize former methods of treatment.

NATIONAL ASSOCIATION OF ALLIED HORSE INTERESTS STARTS A PUBLICATION.—During April there arrived at the REVIEW office a copy of *The Horse Lover*, published by the National Association of Allied Horse Interests, at Providence, Rhode Island. The book is 10 by 13 inches, and contains upward of 40 pages. The cover page is adorned by a handsome pair of coachers, held by a young lady, who stands between their heads. Produced in natural colors, it makes an attractive cover page. The association publishing this monthly deserves the support of all veterinarians. The paper costs but 10 cents a copy, or \$1 a year, and is worth much more than that amount. Write to *The Horse Lover*, Industrial Trust Co. Building, Providence, R. I.

HOG CHOLERA AND THE PRODUCTION AND USE OF HOG-CHOLERA SERUM.*

BY DANIEL E. SALMON, D.V.M., BUTTE, MONT.

The title of this paper, which was assigned me by your honorable secretary, is comprehensive enough to cover a volume of no mean proportions; but I hope that none of the members of this association is apprehensive that an attempt will be made to treat the subject exhaustively at this meeting. The most that the writer can hope to do is briefly to express his views in regard to certain points in which it is to be supposed that veterinarians are especially interested. That many subjects will be omitted and others but very inadequately treated, follows as a matter of course

OBSERVATIONS IN REGARD TO HOG CHOLERA.

Hog cholera is a disease which during the last two or three years has received the most extraordinary attention, not only of veterinarians, but of farmers and many other classes of the community interested in the purchase and sale of pork products, the conservation of the nation's food supply and the reduction of the present high cost of living. The disease seems to have been unusually prevalent and malignant, and this, coupled with the advent of the serum treatment, has led to a feeling that the time has come when this contagion should be controlled and perhaps eradicated. Many of the hog-growing states, as well as the national government, are making preparations either to carry out experiments on a large scale or to begin the work of eradication. The subject is, therefore, one which at this particular time merits your attention, perhaps more than any other which is before the profession; and every veterinarian should be prepared to give expert advice in regard to all points connected with the

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disease, and to administer the treatment in the most approved manner.

Hog cholera is a peculiar disease in several respects. It is peculiar in the great susceptibility of hogs to the contagion, its rapid spread through herds and localities, and the malignancy of its action. In these respects it can hardly be compared with any other disease of animals than the cattle plague, which from time immemorial has been the terror of cattle raisers in most parts of the world.

It is, also, peculiar in that it is not communicable, by inoculation or otherwise, to any other species of animals. This fact makes it necessary that all the experiments made to study the disease and its contagion should be performed upon swine; and likewise all tests of the virus and the serum must be carried out with these animals. This has made the study of the disease and the production of the serum unusually difficult and expensive, since we must discard the small laboratory animals which may be produced and maintained in unlimited quantities and at little cost, because they are not available for the study of the disease or the testing of its products.

This disease is again peculiar because there is always, or nearly always, associated with it and present in the principal organs and blood a bacillus which is not the essential cause of the disease, but is so constantly associated with that cause that it is called the hog-cholera bacillus, and for many years was supposed to be the active and essential pathogenic agent. The writer is not in a position to state, even after all of these years of investigation, exactly which of the symptoms and lesions should be attributed to the hog-cholera bacillus and which to the filtrable cause of the disease. The hog-cholera bacillus is a pathogenic microbe which sometimes has considerable virulence, and its habitual presence in diseased animals is a complication which it would be very unwise to ignore.

If we go back to the early experiments of Theobald Smith, we will find that upon one occasion he inoculated a pig intravenously with 5 c.c. of a beef-infusion-peptone culture of the

bacillus made from an agar culture about a week old. Now as the filtrable virus is not cultivable in such media, there hardly could have been sufficient of it present in the liquid inoculated to produce a very intense effect. If it had any pathogenic action whatever, under such conditions, we should expect that the symptoms would be slow in appearing and mild in character. But in this case, on the contrary, there was a rise in temperature of $3\frac{3}{8}$ degrees F. to 107 degrees within two hours after the inoculation. Two days after the inoculation there was a temperature of $107\frac{3}{4}$ degrees, and the third day the animal expired. That is a more rapid course than we should expect from the filtrable virus, even if a large dose had been given, so that we may, at least provisionally, conclude that the sickness and death of this animal were due to the bacillus and not to the filtrable virus. The autopsy was especially interesting from a diagnostic point of view. There was a general blush on the skin of the ventral aspect of the body, snout and lips. Spleen enormously enlarged, gorged with dark blood and friable. Superficial inguinal glands enlarged, edematous, with congested cortex. Bronchial and renal glands enlarged, partly hemorrhagic; gastric glands hemorrhagic throughout substance; the mesenteric and meso-colic glands all deeply congested throughout their substance. Blood thick, dark colored, coagulation slight, even after several hours' exposure to the air. Several petechiae on epicardium of right auricle. Kidneys enlarged, deeply congested throughout. The surface thickly dotted with minute red points. The papillae so deeply reddened that any extravasations would be unrecognizable. A few petechiae in pelvis. Bladder contained about thirty grams of urine tinged with blood. The whole mucosa of stomach deeply congested. In the fundus it was hemorrhagic with numerous patches of necrosed epithelium one-fourth to one-half inch across. The upper eight inches of the duodenum in same condition as fundus of stomach. Numerous red points scattered over mucosa of entire small intestine. The mucosa of caecum and upper colon very slightly congested, but the remaining two-thirds intensely so. Hemorrhage here and there sufficient to stain the feces with

blood. Cover glass preparations and cultures from splenic pulp revealed only hog cholera bacilli. In other experiments by subcutaneous inoculation of cultures he observed extravasations on auricular appendages of heart and on the lungs, with minute hemorrhages throughout the parenchyma of the lungs.

Now let us compare these lesions with those given by Dorset as those of acute hog cholera. He mentions red or purplish blotches of the skin, small hemorrhagic spots in the lungs, hemorrhages on the surface of the heart, spleen almost without exception quite large, dark and soft, kidneys with dark red points over the surface frequently reminding one of the speckling of a turkey's egg, the lining membrane of the stomach very much inflamed and red, frequently showing evidence of ulceration, the outer surface of the small intestine may be literally covered with bloody spots and the inner surface may be dotted with similar lesions. The outer surface of the large intestine may show the same hemorrhagic spots and the inner lining is frequently blood stained and has small areas of bloody extravasation. It is frequently found that the feces contained in the large intestine are bloody, due to hemorrhages. The lymphatic glands are enlarged and reddened, at times almost black.

Dorset recapitulates as the important lesions found after death in acute hog cholera:

1. Reddening of the skin.
2. Bloody spots in the lungs, on the surface of the heart, in the kidneys, on the outer surface and inner lining of the intestines and stomach.
3. Reddening of the lymphatic glands.
4. Enlargement of the spleen.

All of these, with the exception of hemorrhages on the outer surface of the intestines, were observed by Smith in the autopsies of acute cases of disease produced by inoculation with cultures of the hog cholera bacillus.

It is clear, therefore, that it not only is difficult to make a diagnosis, except by laboratory methods, between disease caused by the hog-cholera bacillus and that caused by the filtrable virus, when they occur separately, but that it is equally difficult to specify

precisely the part played by each in the complex which we designate hog cholera.

To illustrate the practical application of these facts in explaining the phenomena of hog cholera, as encountered in dealing with this disease, a recent experience of the writer may be related. A carload containing about 90 shotes, supposed to be susceptible to hog cholera, were received at the plant of the Highland Serum Co., to be used for the production of virus and for testing serum. About half of these pigs were placed in a pen at one side of the grounds supposed to be free from infection, the other half was placed in infected pens. It was not long before those in the infected pens began to sicken, and inoculations were made with blood taken from them, both immediately before and immediately after death. Now, although the disease in these pigs assumed a very violent form, causing death in about two or three days from the appearance of the first symptoms, and although the lesions were very marked and coincided with those which we consider characteristic of hog cholera, particularly hemorrhages of the skin, of the surface of the heart, of the lungs, of the outer and inner coats of the intestines, of the lymphatic glands, and of the kidneys, with enlargement of the spleen, we never succeeded in reproducing the disease by inoculation of the shotes which had been held in the pen supposed to be uninfected. Three or four of this lot contracted the disease by infection, but these animals appeared immune to subcutaneous and intramuscular inoculations with the blood of those which sickened spontaneously, and, also, to the stock virus which we had on hand. Pigs from this lot were then inoculated with fresh cholera virus from three different sources in which we have the utmost confidence, and in no case did cholera develop from these inoculations.

What are we to conclude from such an experience? In the first place, if the disease which developed spontaneously was cholera, it should have been inoculable by subcutaneous and intramuscular injection of the blood of the dying and recently dead animals. In the second place, if these pigs had been susceptible to cholera, they should have contracted it from the intramuscular

injection of one or more of the four strains of virus which were used upon them. If the disease was not cholera, and the pigs were insusceptible to cholera, is it not reasonable to conclude that it was the very similar disease caused by the hog-cholera bacillus, which is only transmitted by subcutaneous inoculation with difficulty, even when large numbers of bacilli are injected, and probably would not be caused by the relatively small numbers existing in the quantity of blood used for the inoculations? In each of the experimental inoculations, from two to four animals were injected and about forty inoculations were made altogether, so that the experimental evidence is not lacking as to the principal facts.

There is another interesting observation connected with this outbreak, which should be mentioned to complete the case. So many pigs were dying, among those in the infected pens, without yielding any results in the production of virus that it was decided to give the remainder the simultaneous vaccination. As a result of this treatment, the disease was arrested within a week from the time the animals were vaccinated.

The question now arises, Should this observation as to the result of vaccination modify our conclusions as drawn from the other experiments which have already been mentioned? This is not an easy question to answer. It must be admitted that, in hyperimmunizing hogs with large quantities of blood from animals in the last stages of cholera, we are introducing, in many cases at least, considerable numbers of hog-cholera bacilli, and that, consequently, the serum produced should in many cases have a protective action against the hog-cholera bacillus as well as against the filtrable virus. This would seem to be a consistent explanation of how the vaccination with hog-cholera serum and virus could arrest an outbreak of disease caused by the hog-cholera bacillus. Of course, a laboratory study of this disease would have thrown more light upon its nature, but would have required much more time than could be given to it.

Finally, if these pigs were immune to cholera, How did they acquire their immunity? They were from a ranch where there

had been no vaccination and no cholera, and, although the sows had been purchased within the year, it is not probable that they had been vaccinated.

OBSERVATIONS IN REGARD TO THE PRODUCTION OF HOG-CHOLERA SERUM.

Potency.—Hog-cholera serum produced by either of the four methods in common use appears to be equally potent, and, so far as the user is concerned, there is no reason to choose one rather than the other. Some are claiming that the intravenous injection of the virus produces the most potent serum, but an examination of the experiments of Dorset and McBryde lends no support to this assumption. On the contrary, the most potent serum which they obtained appears to have been that of Hog 1383, which was "a slow immune." The serum from this hog was so potent that in the dose of 5 c.c. it perfectly protected 30 and 35-pound pigs from inoculation with 1 and 2 c.c. of virus, and even in the extremely small dose of $2\frac{1}{2}$ c.c. for such pigs it enabled them to survive the inoculation, though they were sick as a result of it.

The intravenous injection of the virus, however, is practiced in most cases because of its convenience and rapidity; but with some hogs the ear veins are not suitable for injection, and these must be injected subcutaneously or intraperitoneally. Sera of the highest potency are obtained by each of these methods of injection.

Nature of the Serum.—The hog-cholera serum, from the observations of the writer, appears to be an anti-toxic rather than a bactericidal serum. This would be anticipated from the large dose of virus given in hyperimmunizing, and from the toxic effect which such doses generally produce, beginning soon after the injection and lasting for several days. In one experiment made by the writer by mixing the serum and virus, and leaving them in contact an hour before injection, 4 out of 6 animals developed cholera, and 2 of them with extraordinarily short periods of

incubation and violent symptoms. That is, the serum, by direct action on the virus, neither destroys it nor lessens its virulence; on the contrary, under such conditions, it appears that the virus diminishes or destroys the efficacy of the serum. Acting under this conviction, the Bureau of Animal Industry requires that the virus and serum be prepared in separate rooms and with an entirely independent equipment.

The Production of Serum Free from Contamination.—The producer of serum should use every precaution to avoid to the utmost extent the contamination of his product with microbes of all kinds, and especially those having pathogenic action. It is not so much of the laboratory technic that I speak, but of other conditions which affect the purity of the serum and which have not been so definitely specified.

It has been a common practice of some producers of serum to get the virulent blood for hyperimmunizing from animals which sicken in infected herds and the history of which cannot definitely be ascertained. In few cases of this kind can it be determined just how long the infection has been developing in the animal's body, and what the chances are of infection with other microbes than that which produces hog cholera. We know, for instance, that the hog-cholera bacillus is often present as a contaminating organism, and that as the disease approaches the chronic type and is prolonged, other microbes may gain entrance to the blood. The entrance of these contaminating microbes is no doubt facilitated by the ulcers of the intestines, which make their appearance in from ten days to two weeks, and which offer an open gateway for the admission of such micro-organisms; but even in the absence of these ulcers the blood may be contaminated with virulent bacteria which cause havoc in the injected animals.

In one case a pig, which had mild symptoms of cholera for a week or two, suddenly showed violent symptoms, with intense redness under the jaw and breast. This pig was bled, and the lesions shown at the autopsy being identical with those of acute hog cholera, its blood was used on three hogs—two receiving it

intravenously and one subcutaneously. The two which were injected intravenously, died from the injection, notwithstanding that they were already hyperimmune from having received large doses of virus, while the one injected subcutaneously had extensive abscesses wherever the blood was injected. This blood must have been very heavily infected with active pus producing organisms before the death of the pig from which it was obtained, and we are led by this experience to inquire what would happen if we hyperimmunized with blood which was contaminated with such microbes, but not in sufficient numbers to produce visible symptoms in the injected hogs. Would not some of these microbes remain in the blood of the hyperimmunes a sufficient time to contaminate the serum?

The blood of another pig which had contracted the disease from an infected pen was being used for subcutaneous injection when it was observed to have a peculiar appearance, the coloring matter separating from the serum as a granular, brick-dust like deposit. This blood, also, produced many abscesses.

As a result of these and other observations, no blood is used by us for hyperimmunization, unless the hog from which it was obtained has been infected for that purpose by inoculation, and we know exactly the period of incubation which it has passed through.

For the same reason, no doubt, the government requires that blood for simultaneous vaccination shall be collected only from hogs inoculated, which sicken by the seventh day and are ready to die by the fifteenth day.

Hogs for either serum or virus production should be free from abscesses, ulcers of the skin, patches of necrosis, or other similar lesions through which microbes might gain access to the tissues.

In general, it may be said that to produce pure serum and good, reliable virus, there must be both the most rigid aseptic technic in the laboratory, and the most careful selection and handling of the hogs from which these products are obtained. The hogs when bled for serum should have good appetites, a normal temperature and be gaining in weight.

With all the precautions which can be taken, the serum can hardly be expected to be sterile, but it will contain relatively few microbes and seldom produce abscesses. The virus will, undoubtedly, in many cases, contain hog-cholera bacilli, but as this is used in small quantity for the simultaneous vaccination, and as the serum will generally have anti-bodies which protect against this microbe, there should be few, if any, abscesses from this cause.

Caution Against Mixing Virulent Blood from Different Sources.—The blood from hogs affected with cholera often coagulates imperfectly, owing to an insufficient quantity of one of the constituents of the blood, the presence of which is necessary to produce this effect. It frequently happens, therefore, that after virulent blood has been defibrinated, if specimens from different hogs are mixed, there will be complete coagulation, whereas it would remain liquid indefinitely if not mixed. The clotting is due to the constituent which was lacking in one specimen of blood, probably the ferment from the leucocytes, being supplied by the other. The veterinarian should, therefore, avoid mixing virulent blood from different bottles, or otherwise he may cause its coagulation and find himself without suitable virus to continue his vaccinations.

OBSERVATIONS IN REGARD TO THE USE OF HOG-CHOLERA SERUM.

The Development of Abscesses in Vaccinated Hogs.—The chief cause of the complaints which we see in the agricultural press concerning the effects of vaccination is that it too often causes the production of abscesses. In a recent issue of the *Breeder's Gazette*, for example, a writer tells of the vaccination of his herd of 87 head, and of a neighbor's herd of 125 head, all of which showed abscesses on one side and "quite a few" on both sides. These abscesses continued to develop for "a third of a year" after the injection, though they did not affect the immunizing power of the vaccination.

A result such as this is assuredly very serious and emphasizes the importance of seeking the cause and taking every precaution to avoid it. Abscesses may undoubtedly originate by infection from two sources: one of these is contaminated serum or virus, the other is infection at the time of vaccination or soon after. In the case just mentioned, as the veterinarian at another time and from a different lot of serum vaccinated two other nearby herds, the animals of one being very dirty, without the development of abscesses, it seemed probable that the fault was with the serum or virus, or both. However, such a conclusion is not absolutely certain, since it is not impossible that a virulent pus-producing microbe existed on these two premises and not on the other two, and that the infection occurred at the time of vaccination; but the probability is in favor of the other hypothesis. It must be freely admitted that the operating veterinarian should not be blamed for all of the abscesses that follow vaccination, and that if a very large proportion of the vaccinated animals develop them, under ordinary conditions, suspicion must rest upon the serum or virus. However, it must not be forgotten that there are many obstacles to the carrying out of a perfect technic in the field, and that, with every precaution which is practical, some infections are liable to occur, either at the time of injection or soon afterwards, which will lead to the development of an abscess at the point of inoculation; but such infections should not occur in a very large proportion of the animals operated upon.

On the other hand, carefully prepared serum from animals in perfect health should not contain, at the time it leaves the laboratory, microbes which will produce abscesses in a very large proportion of the animals injected with it. Some animals, however, have a much greater tendency to abscess production than others and seem to be carrying the pus-producing organisms in their blood before they are vaccinated, all that is necessary for the development of an abscess being the irritation caused by the injection of the serum. Their condition resembles that of some persons in whom boils and larger abscesses develop with the

slightest provocation or even with no apparent provocation at all. Such a condition, of course, cannot be foreseen or guarded against, and, therefore, there will probably be some abscesses following vaccination, though a very small proportion, even if the most rigorous precautions are observed by both the producer of the serum and the veterinarian. But pure serum is often contaminated before it is used by allowing dust to get into it when the cork is removed, by pouring it into imperfectly sterilized basins, by allowing the wind to blow dust from the pens or yards into it, while the vaccination is in progress and by other acts of imprudence. For example, the writer has seen the operator sterilize his basins faultlessly, and then proceed to pick them up in such a manner that his not very clean thumb came in contact with the inner side and immediately reinfected them.

To show how little danger there is of producing abscesses with pure liquids under good conditions for injection, the writer has frequently injected 40 to 60 syringefuls of virus subcutaneously in one hog without producing a single abscess. Although the syringe held 20 c.c., and virus is more likely to be contaminated than serum, because it comes from sick hogs, while serum comes from well ones, it is only in a small proportion of the hogs that abscesses develop. So that with good liquids and proper precautions abscesses may be reduced to an insignificant factor in the general result.

The production of hog-cholera serum and virus is not the simple affair which many suppose it to be, however; it requires an extensive plant and must be guarded by every precaution that experience can suggest.

The Application of the Serum-Alone Method.—While the veterinarian will, in most cases, be employed to give the simultaneous vaccination, there are certain advantages at times in the use of serum alone. Quoting from a paper recently prepared by the writer, these advantages are:

“1. The protective action begins within a few minutes after the injection of the serum. 2. It has a curative as well as a

protective effect. 3. It does not cause fever or loss of condition, even with delicate animals. 4. Its use is free from the danger of introducing the cholera contagion to non-infected farms or ranches. 5. It stops the development of the disease in those animals which have taken the contagion into their systems within four days before the serum is given."

The one disadvantage inseparable from the serum-alone method is that the protection thus afforded is generally of short duration and, unless enough contagion is picked up from the premises to change the passive into an active immunity, probably does not last more than two or three months in the most favorable cases.

With reference to the first point, it is probable that the simultaneous vaccination, also, begins its protective action almost immediately, if the doses of serum and virus are in proper proportion. It often has been said that immunity is not completely established by this method for two or three weeks, but I know of no experiments to sustain this assertion. The fact that virus is injected at the same time as the serum and that the animal resists it shows that there is immediate immunity, and, so far as my experience goes, you may immediately expose the vaccinated hog in infected pens or in contact with sick hogs and it will resist the contagion.

However, if the doses of serum and virus are so adjusted that the hogs become sick from the vaccination alone, the small additional quantity of virus obtained from the exposure may be sufficient to turn the scale and kill the animal. In vaccinating, therefore, especially where animals are exposed to the contagion at the time, there should always be a surplus of serum, so that the vaccinated animals will not get sick from the vaccination, and will be able to dispose of the small quantity of virus which they obtain in addition by the exposure.

As to the second point, while serum certainly has some curative action, it is not very marked when but a single dose of ordinary size is administered. Its advantage in this respect is, consequently, not very great.

As to the third point, the simultaneous vaccination often does cause fever and loss of condition, but it should not do so, and will not do so, if the serum and virus are in good condition and the doses are properly proportioned.

The fourth point should be given great weight because it is very difficult to inject 50 or 100 hogs without losing a single drop of virus, or, for that matter, several times a single drop. A drop of virus may unexpectedly escape from the puncture despite all precautions, or the expansion of the liquid in the syringe from the warmth of the hand may force a drop or two from the point of the needle while the operator is waiting for the next animal. Then, there is always the danger that a very susceptible animal may develop the disease from the vaccination. In either of these cases there is an infected premises which might have been avoided by the use of serum alone.

The fifth point is one which, in the opinion of the writer, has not as much importance practically as is generally given to it and as it would seem to have from theoretical considerations. That hogs which have had the contagion in their tissues for two, three or four days before the simultaneous vaccination will be saved with the same certainty as those which receive serum alone, appears doubtful; nevertheless the difference may not be great, providing only that a small dose of virus be used in the vaccination. The government experiments indicate that there is little difference in the results of the two methods under such conditions.

There is, consequently, but one apparently serious disadvantage connected with the serum-simultaneous treatment, as compared with the serum-alone, and that is the danger of introducing the contagion upon uninfected premises. This generally will be outweighed by the owner's desire for permanent immunity; and if he vaccinates all his hogs, as he should, the question of contagion does not greatly concern him, since there are no susceptible animals to be affected by it, and ordinarily it will soon disappear.

The time of year should have considerable influence in deter-

mining if serum alone is admissible. If it is early in the season, with a long period before slaughtering or marketing, the simultaneous treatment would be almost indispensable; while late in the season, with but a month or two to slaughtering time, serum alone would be sufficient.

The Application of the Serum-Simultaneous Method.—As already mentioned, the requirement of permanent immunity is the principal indication for the adoption of the serum-simultaneous method in preference to the use of serum alone. This long-time immunity is so desirable that it generally outweighs and overshadows the slight disadvantages which are or may be connected with the serum-simultaneous method, and makes the application of this method indispensable. Breeders wish to insure their hogs against loss by cholera, during life if possible, and, therefore, must begin by so immunizing the young pigs that they will retain the immunity for a long period. The immunization of young pigs is, consequently, a subject to which we may profitably give our attention at this point in our discussion.

The investigators of some of the State Experiment Stations have observed that the pigs of immunized mothers are very resistant to the hog cholera virus, and have concluded that such pigs need no protection until about weaning time. It has even been proposed to reinforce this natural immunity by the injection of a small dose of virus alone at the age of three or four weeks, and to reinforce it again, in the same manner, at a later period. This method, if reliable, would be the means of obtaining immunity at a much lower cost than by the serum-simultaneous method, since only two small doses of virus are required. Our experience in managing several hundred pigs from immune mothers, during the past year, is not very favorable to this method. A considerable number of these litters showed sickness when about three weeks old, and it became necessary to vaccinate them. It is true that the greater number of litters resisted the contagion until weaning time, or, at least, were not acutely affected, but some of these appeared to be retarded in their growth and unthrifty as a result of a chronic infection.

There was one lot of 26 pigs in a pen adjoining an enclosure containing some sick hogs, and it was thought best, on account of this exposure, to give them the simultaneous vaccination. They weighed 10 to 15 pounds and were given $\frac{1}{4}$ c.c. of virus and 10 to 15 c.c. of serum each. Six of these pigs contracted cholera and died in from 13 to 25 days after vaccination, and the indications were that more would have been lost if they had not been given another dose of serum. Perhaps it should be explained that this serum was not of our manufacture, though it seemed to be good commercial serum; however, the point which I wish to emphasize at this time is not the insufficiency of this serum, but the lack of resistance of these pigs. They were not only unable to withstand a dose of virus without serum, but their resistance broke down even when reinforced by a dose of serum.

From these observations it appears wise to treat pigs at about the age of ten days with either a dose of serum alone or with the simultaneous vaccination.

The administration of carefully graduated doses of serum and virus to small pigs, when vaccinating by the simultaneous method, seems to be a matter of considerable importance. The dose of serum usually recommended is 1 c.c. per pound up to ten pounds, and 10 c.c. for those weighing from 10 to 20 pounds. This formula has never seemed quite satisfactory to me, for if the dose should be in proportion to the weight, and 10 c.c. is required for a 10-pound pig, it is hard to see how 10 c.c. can be sufficient for a pig of twice that weight.

The dose of virus recommended has usually been $\frac{1}{2}$ c.c., possibly because this is the smallest quantity which most of the syringes used for this purpose will measure. But $\frac{1}{2}$ c.c. of virus is too much for a pig weighing, for example, 5 pounds and which gets but 5 c.c. of serum. The proportion of virus to serum in this case is as 1 to 10, which is the same as that recommended in the government bulletins for a 50-pound hog—in which case it is 20 c.c. of serum and 2 c.c. of virus. The tendency has been to recommend a smaller dose of virus even for large hogs than

that used by the government investigators, some placing the dose as low as $\frac{1}{2}$ c.c. for all hogs up to 150 pounds, the relation between virus and serum being in the case of the 150-pound hog as 1 to 100. An intermediate position seems to be better for the present than either extreme, and we, therefore, recommend 1 c.c. of virus and 35 c.c. of serum for hogs weighing from 50 to 75 pounds; and this ratio of 1 to 35 or 40 we believe to be all right for hogs of over 50 pounds. Young pigs are so much more susceptible, however, that with those of two to three pounds we make a ratio of 1 to 100; with those of 3 to 6 pounds, 1 to 80; with those of 6 to 50 pounds, 1 to 50.

It is true that the government investigators have used more virus and less serum than we recommend, and, consequently, their ratio has been much narrower; but it has seemed to us that in field work, and especially here in the Northwest, where until recently there has been little cholera and the hogs are very susceptible, it is better to reduce somewhat the dose of virus and to increase that of serum. In our experience we have obtained immunity without producing disease by this dosage, while with the other there were too many sick and too many stunted hogs as a result of the vaccination.

For vaccinating young pigs, the dose of virus which we recommend is 0.05 c.c. for those of 2 to 3 pounds; 0.10 c.c. for those of 3 to 6 pounds; 0.20 c.c. for those of 6 to 10 pounds; 0.30 c.c. for those of 10 to 15 pounds; and 0.40 c.c. for those of 15 to 25 pounds. The ordinary syringe will not accurately measure these small doses, and, therefore, we have had constructed a special syringe with which they may be administered with great exactness. This syringe has a long glass barrel of small calibre that has a capacity of but one cubic centimeter, so that twentieths of a cubic centimeter, or about the equivalent of one drop, are easily injected. The syringe is well armored with metal to protect it from breakage and at the same time permits the operator to see whether it is completely filled with virus or partly with air. The great objection to the all-metal syringes for

virus is that you cannot see whether or not they are completely filled with virus and, consequently, the dose may or may not be accurately measured.

Returning now to the immunization of pigs, the writer is inclined to recommend that they be given the simultaneous treatment when ten or twelve days old, preferring this to the serum alone because of the longer duration of the immunity, and that they be given a second simultaneous treatment when 3 or 4 months old. It is generally admitted that the immunity which young pigs receive from the simultaneous treatment lasts but a few months, and that a second treatment is, consequently, required. This second treatment should be late enough, so that the immunity which is derived from it will last during the life of the animal, and while the best time for it has not been very definitely fixed by experiment, it is not far from that stated above.

At the first immunization the pigs would receive 8 or 10 c.c. of serum and 0.1 to 0.2 c.c. of virus; while at the second treatment, if three months old, they should weigh about 50 pounds and receive 20 c.c. of serum and 1 c.c. of virus. The total quantity of serum and virus used per hog would, therefore, be about 30 c.c. costing 60 cents. If serum alone is given at ten days, the dose would be 6 c.c., and the simultaneous treatment should follow at about two months of age, the animals receiving about 20 c.c. of serum and 0.4 c.c. of virus. The cost in this case would be about five cents less than in the former, but there would be more danger of the immunity disappearing before the animals were slaughtered.

These few observations in regard to hog cholera and the production and use of hog-cholera serum are offered for your consideration because they relate to problems which recently have engaged our attention and which are of a practical nature. There may be some things yet to learn in regard to this disease and the application of the serum treatment; but it has been clearly demonstrated that this treatment as now recommended is efficacious in protecting hogs from the ravages of this contagion without having any serious disadvantages when properly applied.

SOME COMMON DISEASES OF ANIMALS AND THEIR TREATMENT.*

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After such a splendid practical paper on the horse as Lieutenant Shiverick has given us, I think it is apropos for me to discuss ailments of the horse. During the meeting yesterday, last evening and this morning, it seems to me that I have talked to at least one-third of the people here on contagious diseases, such as rabies, tuberculosis, hog cholera and the like. I am quite certain that Dr. Moore and Dr. Wills have talked to the other two-thirds; therefore, I think I shall evade all these infectious diseases and attempt to enumerate some of the simple things that occur on the farm.

I appreciate the fact that I have a pretty exacting audience and I know if I say much about the horse I shall have to be careful as to how I say it, as there are so many experienced horsemen present. But there are perhaps some present who have taken to the farm and horse industry of late and who would appreciate some advice. It is not necessarily the farmer who always makes the great horseman, or the country boy who always makes the great farmer. We heard last night from Mr. Wainright some things that he has put in operation on his farm, rather late in life some might say, but I am sure his results would do credit to a seasoned farmer. To illustrate how a man can be handicapped in youth and still become great along certain lines, they tell a story about Colonel ————. When he was a boy his father did not keep horses, and the Colonel was very anxious to have a horse, so he induced his father to buy one. He was later telling a friend one day of his great desire to own some good horses and

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get in the horse business, and related how he went with his father to purchase their first horse. He said: "I remember when father took me one day to a livery stable and we saw there one of those spotted horses. We had heard that such colored horses were circus horses, so father asked the liveryman if the horse was a circus horse, and the liveryman assured him that it was. So we thought this would be a fine horse to have. Father bought the horse, harness and wagon for such a reasonable price that he was quite pleased. After the sale was made and we were about to start home the liveryman said, 'Just to show you this horse is a circus horse I will whisper to him to go lame in the left fore leg and he will do it.' And, sure enough, the horse went lame in that leg all the way home." [Laughter.] Of course the Colonel knows to-day what the liveryman did to his father, and no one could sell that kind of a circus horse to the Colonel now; but it shows how little experience one may have in early life and still become a great horseman or a great farmer later.

In beginning the discussion of the diseases of animals, it might be well to start with the colt. I recognize the fact that there are several breeders here, that to enumerate to them the way to care for a mare in foal and the care of the new born colt would be something perhaps that they already know. But again there may be others who have had little or no experience in these matters. Briefly, we think the mare will do best, as you know, if she has regular work or exercise. If your brood mares can not be kept at work of a reasonable kind, then they should have a roomy paddock, or, better, be turned to pasture; and when the colt comes, remember it needs perhaps more attention, more artificial aid, so to speak, than any other domestic animal. We like to see that the various organs are normal. Pay special attention to the intestinal tract. The little colicky pains the colt oftentimes develops ordinarily are not serious, but we are sometimes called to see colts that practical horsemen have been fussing with perhaps all day or part of the night with a little paregoric or castor oil, and still the colic has not been relieved. It is true that ordinarily these simple remedies with good nursing will relieve these intestinal

irritations; but there is another condition that happens a little oftener perhaps than is generally recognized, and that is a displacement of the bowels. It is scientifically termed volvulus or intussusception. This is a condition where the little bowels become twisted, or one part slips into the other, as if we turn the finger of a glove partly inside out. A very practical way of relieving this in most cases is by what we might term "high enemas." Every veterinarian and even stockmen should have one of the latest improved stomach tubes and pumps, and by using this stomach tube and pump and gently forcing water into the bowel, at the same time raising the hinder part of the colt, we can oftentimes so dilate the bowel that the tube may be passed in several feet and water carried well into the bowel, which in turn releases the imprisoned part by dilation of the bowel. We notice relief from pain and complete rest as soon as our efforts have been successful. Another thing that horsemen sometimes overlook after they have given these little home remedies, and that is to see that the mare's udder is kept well milked out so that the little colt cannot get too much to eat for a period of, say, 24 to 48 hours. Giving the weak intestinal tract rest is just as essential as other treatment.

A thing that came up at one of the Farmers' Institute meetings recently was relative to the infection of the umbilical cord at the time of birth. A certain dealer and breeder had said that it was wrong to tie the umbilical cord because there was a drip from the bladder that would be cut off. Unfortunately, this man knew just enough anatomy to be harmful to him. He was right about the opening to the bladder, but wrong about not tying it up. The communication from the foetus' bladder into one of the sacks or membranes that covers it in utero is supposed to close at birth, the same as certain other things happen at birth. The point to be kept in mind is that the umbilical cord must be tied antiseptically; we must be clean about it. We should be just as clean in this as a physician would be in tying the navel of a new born child. If the cord has been ruptured before we have an opportunity to tie it with a clean ligature, it would be well to tie it pretty

well up toward the abdomen and place the end of the already broken cord in tincture of iodine.

Assuming that our colt does well and is well nourished by the mother and gradually gets to eating grain, we see that it is housed from the flies during the summer time and that its little feet are kept properly leveled, and it soon reaches a period where its teeth are to be given attention. Some people argue that we need not give the colt's teeth attention. This would depend largely upon the class of animals we have to deal with. In the big, heavy horse his teeth do not need as much attention as the lighter, nervous one. If we take a close-jawed, heavy-muscle horse of a high nervous type, we will find that the least bit of enamel or sharp point that strikes against the jaw will cause him to be bad tempered. This is not so with the phlegmatic loose-jawed drafter. We also like to remove the supernumerary or wolf teeth, as they are termed, not because there is any danger of making them blind—this theory is as antiquated as hollow horn or wolf in the tail—but for those horses we like to have carefully fitted and with a nice light mouth, the mouth that guides well, one of the very first things we do is to remove all objectionable irritants. Therefore we remove these little teeth that are in the way of the bit and that are easily inflamed and make the mouth irritable. We don't do it in the old barbaric way of taking a chisel and knocking them out; we have them pulled out and have it properly and humanely done. Breeders recognize the fact that a four year form is usually the hardest year on a colt. This is so, and in a measure is due to the trouble they have in shedding their molars. Horses shed what we term the pre-molars, or the first three molars, just the same as they shed the incisors, and we sometimes notice the colt chewing his food and spitting it out again, all due to the fact that these little caps or teeth become partly loosened and catch in the cheek and food and hay is packed under them and cause pain and annoyance. A few minutes work of proper dentistry will remove this trouble and do more for the colt than he can do for himself in several months. By saying that the horse's teeth need attention, don't understand me to say that every

horse's teeth need attention. Beware of the fakir who comes along the road and tells you that every one of your horse's mouths needs attention. He wants your money and will be out of your sight as soon as he gets it. A man who will employ a traveling professional man *ought* to be fleeced. No professional man with ability or a conscience needs to travel the road and solicit trade. If he amounts to anything he has a practice at home. But if the horse's teeth do need attention there is not any one thing that will do more good than proper dentistry.

As to feeding and watering horses, we should keep in mind that the horse has the smallest stomach for its size of any of our domestic animals. It will not stand the changes that many of our other domestic animals will stand. Therefore, if you must change feed always remember that you must change it very cautiously, always giving a smaller amount of the new food. It is the same when you put in new oats or new hay. If the breeder and the farmer would be more cautious about changing the feed, the veterinarians would have less to do in the treatment of colics, and it would be just as well, since there are many other things much pleasanter to do than to stand around and watch a poor horse suffer with colic. As to watering your horses, some people ask, should a horse be watered before he is fed or after? It does not matter if you will only do it consistently. Experiments along this line have proven that if we establish a custom it does not matter which way we do it. Any of you know that if you have been in the habit of watering your horses after feeding, if you offer them water before feeding, they will not take it. It is simply a physiological custom that the stomach has established and it wants it that way. With regularity, good care, good housing and good grooming, your horse ought to and will do well.

There are certain things that we should guard against to-day with horses the same as we would with pigs or cows. You know great care is being taken when purchasing animals, particularly pure bred animals, to determine if they are free from tuberculosis, infectious swine diseases, etc. We should use the same precaution in examining our horses carefully before purchasing

as to glanders. Glanders is a very deadly disease in the breeding stable. It is often times very virulent in its character and not always easy to stamp out. Therefore, when we are examining animals as to their soundness we should keep in mind glanders and farcy.

There are also some accidents and ailments that occur on the farm, such as cuts, colic and the like, that every farmer and every stockman should be able to give at least first aid. Oftimes people become very excited if an animal cuts itself, and they will run for some dirty cobwebs and stick them on, and later the wound festers, as they term it, and finally they may need the services of a veterinarian. If they had used a little better judgment at the time of injury, perhaps the wound would not have amounted to much. Always be very clean and do not use irritants on fresh wounds. If there is a great hemorrhage, ordinarily this can be checked by wrapping some cotton and a tight bandage around the parts, and then have your doctor come and dress it.

As to colic. There are different forms of colic—some colics that are preventable, some that are not. A change of feed usually develops a very dangerous form of colic, termed "acute indigestion." If you find your animal has eaten an unusual quantity of food or a moderate quantity of strange food, and develops pain and bloats, the quicker you can get expert service the better. We know to-day that the thing to do in most of these cases is to tap the animal and let the gas out of the intestines, since when a great amount of gas accumulates in the stomach and intestines, the animal if not relieved will die either from shock due to rupturing of some part of the stomach or intestines, or literally smother to death from the pressure of these organs on the diaphragm and that in turn upon the lungs. If the stomach is considerably involved, the thing to do is to empty it by passing a stomach pump. This of course requires an expert, but actually works wonders in cases where it is indicated. In addition to relieving the cause, we sometimes add a little stimulant in the way of whiskey or the like.

The cause of another form of colic is an impaction of the bowels, due to dry bulky food, and this ofttimes while less intense

in character is more dangerous than its mildness at the beginning would indicate. Oils and cathartics are the agents to be employed to remove the cause in such cases.

We have other forms of colic, due to disease in the intestinal tract, particularly the blood vessels, and colics due to calculus (stone in the bowels). These forms of course are not under the control of the owner or care-taker.

Another thing which we notice so much among stockmen is the way which they drench their horses. Every now and then, from carelessness or brutality in drenching, we get a condition which we term "mechanical pneumonia." This could be avoided if proper precaution is taken in drenching the animal. Why, you see some men put a rope in a horse's mouth and pull its head up as if they meant to pull it off, and then stick a big bottle filled with medicine in its mouth, and never taken the bottle out until it is empty. Could *you* swallow with that big bottle in your mouth? Perhaps *you* can, but a horse can't do it. You may be more accustomed to it. (Laughter.)

Severe colics, particularly acute indigestion, sometimes brings on a condition that the doctor may be blamed for, and that is laminitis, commonly called founder. After an animal has a severe attack of colic, which is necessarily attended with great rolling about and pain, and is then allowed to stand in a draught and cool suddenly, on attempting to move the animal later we may find that it can scarcely back up or move about. This sometimes can be avoided by properly covering the animal as it begins to get quiet and cool off, or by walking it gently about, but sometimes it occurs even with all these precautions. You know the idea used to prevail that if a horse was once foundered it was never any good again, but we know now that if properly treated and taken in time we can in most cases relieve the condition so promptly that the animal is as good as ever in every sense of the word. Whenever you have a foundered horse, don't deceive yourself by thinking the trouble is in his back because he can't back up, and waste time by rubbing magic liniments and oils on its back before sending for a doctor, but send for your doctor

immediately, get poultices on the horse's front feet and place his feet in a tub. Your poultices may be bran or anything that will make a cushion to stand on and hold moisture. Fill the tub sufficiently to cover the feet well with either very hot or very cold water, whichever you can properly attend to. If I go to a stable where there is a foundered horse and I feel that conditions are not right for the water to be changed often and kept warm, I then prefer to get a cake of ice and keep the water very cold. There is not much difference in the action between extreme heat and extreme cold, excepting that the heat relieves pain quicker and in case of founder the animal will make greater progress the first few days. Therefore, I prefer hot water to cold water when I feel that it can be properly attended to. The question is sometimes asked: "Should we remove the shoes?" Some veterinarians do and some do not. I think it is best not to remove them. My reason is that there is congestion in the foot and with the soaking it must necessarily expand or swell, and it is my opinion that with the shoe left on we are less liable to have a drop sole, as it assists to hold the junction of the wall and sole in apposition. When your veterinarian arrives, do just as he tells you and don't listen to everybody's advice. If the veterinarian knows his business it will only be a matter of a week or ten days before your horse is pretty well relieved, and in another short period he will have him at work for you again.

There are other diseases that need prompt treatment, and I would like to call your attention to one or two of them. For instance, lymphangitis, commonly called "Monday morning leg." The reason for calling it Monday morning leg is that it usually occurs after an animal stands in the stable a day or two, like over Sunday or a holiday. Then we often find one of the legs, usually a hind leg, all swelled up. The common error is to think that the horse has injured the leg during the night, and then apply liniments and irritants. Liniments simply aggravate the condition. What you should do is to send for a doctor at once, as he can do more for you in the first 24 hours than he can in three weeks after the swelling of the leg has become organized.

If called early, your veterinarian can get the bowels and kidneys active and do up the leg in hot packs, and in three or four days the pain will be sufficiently reduced so that the animal may be moved, and moving in this ailment is one of the most valuable aids in relieving the condition. We would not think of driving a horse that had a badly sprained leg all swollen up, but we want to drive one with lymphangitis just as soon as we can move him, and then, of course, properly care for the leg after driving.

There is still another disease that needs equally as prompt attention, and that is what the older men used to speak of as *spinal meningitis*. We really do not see many cases of spinal meningitis. We do have epizootics of the so-called cerebro-spinal meningitis, but what the older men called spinal meningitis is usually azoturia. We usually see these cases on a Monday morning, or a morning after a holiday. It occurs in the well nourished, well kept horse that is regularly worked for exercise and then stands in a day or two. The longer they stand in the less liable they are to have it. The animal is then taken out and driven and feels fine and perhaps plays in the harness, and after going a little way we notice that there is an unusual perspiration, or perhaps an increasing lameness in one of the legs—usually a hind leg—the animal knuckling over at the fetlock. A well meaning driver will immediately think of getting the animal back home. What they should do is to stop the horse right where it is, cover it up and keep it quiet. Every step taken after the disease begins to develop increases the danger of paralysis and brings the animal nearer to death. I would rather treat one standing up in a snow bank than in a parlor after he gets down. If there is a shed or stable near by, lead the animal to it and put plenty of blankets on it, keep the animal just as quiet as possible and send for your veterinarian. This is one of the deadly diseases that is largely preventable by giving the horse bran mashes on Sundays and holidays, and by knowing the character of the disease and stopping the animal as soon as any symptoms are shown.

RES JUDICATAE. VETERINARY EDUCATION.*

BY CHAS. H. HIGGINS, B.S., D.V.S., F.R.M.S., OTTAWA, CAN.

History does not record in detail the early progress made in the study of diseases of animals, nor the means taken to combat or prevent their recurrence. We are aware, however, that something over two thousand years prior to the Christian era great stress was laid on the proper feeding of animals that were desired for work. These rules for feeding do not materially vary from what would be considered proper to-day. At this early period, "a doctor of oxen and asses" was accorded a legal fee as was his *confrère* who treated the ills to which human flesh is heir, and there was always a penalty in the event of his being unable to perform a cure. This penalty, however, was less severe than that prescribed for failure in the treatment of the human being.

To Columella,† a veterinary surgeon who lived during the first century of the Christian era, belongs the credit of insisting that hygienic surroundings, isolation and proper food were necessary adjuncts in dealing with sick animals. This it seems is prior to any reference to a similar procedure for the control of diseases among human beings.

The *Hippiatrika*‡ is preserved to us through the foresight of Constantine§ and "reproduces the written opinion and views of the experts of the Eastern Roman Empire, the birthplace of the veterinary art or certainly of veterinary literature, and it is because it represents what men in our profession fifteen centuries ago thought on subjects which are engaging our attention to-day

* Reprinted from *The Canadian Medical Association Journal*.

† "The Early History of Veterinary Literature and its British Development." Major General F. Smith, C.B., C.M.G., F.R.C.V.S. (*Jour. Comp. Path. and Therap.*, Vol. XXVI, 1913.) L. J. Columella in his writings dealt exhaustively with the care, management, breeding and feeding of domestic animals. He was the first to point out the necessity for the isolation of affected animals when contagious disease appeared.

‡ *Ibid.* The compiler of the *Hippiatrika* is unknown, but it consists of a summary of the writings of the authorities in veterinary science up to that time.

§ *Ibid.* Constantine the Seventh, Emperor of the later Roman Empire, with the designation, "Porphyrogenitus," (born in the purple), lived from 911 to 959 A. D.

that their work becomes of such interest and value." This work, however, does not now exist in its original form, but copies are available for reference. The data included in the manuscripts which have been preserved indicate that these copies do not agree in all particulars, doubtless the result of the work of copying being undertaken at different periods by several individuals, each of whom, either by design or unintentionally, made changes in the transposing of the text. The copying at this early time was necessarily performed by hand and naturally lent itself to many errors, some of which, though minor in themselves, materially changed the purport of the author. The writings of the early veterinarians which have thus survived the vicissitudes of time and are now available in a very imperfect form, indicate that the views then held on many ailments were not widely different from those obtaining in this enlightened age. The authors of the Byzantine period contributed much to the knowledge of the science, and it seems that veterinarians were then familiar with many of the contagious diseases of animals, although their knowledge was founded on a less sound scientific basis than is ours to-day. That these men were esteemed, is evidenced by the positions of trust which they held and the confidence with which their teachings were accepted. After Constantine, a considerable time elapsed during which it is evident that many of the writings were lost, and in addition this territory was invaded by the Mohammedans who carried such veterinary teachings as were found to Arabia, and, thanks to the employment of translators, usually learned Jews, such of the writings as were available were translated from the Greek into the Arabic and thus preserved. To similar translators we are indebted for the subsequent translation from the Arabic into the modern languages. This transposition is in a large measure responsible for the existence of the earlier works to-day, as very few are now available in the language in which they were originally written.

Notwithstanding these early historical data, we must look to the advances during our own time, with a view of ascertaining whether we are doing our utmost to advance the art and science

of veterinary medicine, for history is indelibly recording the results of our efforts for others to read, after we as individuals have ceased to worry over ideals, and when collectively we will be but a memory, known only by the writings of those who have been foremost in raising the educational standards of our calling.

From time to time the art and science of dealing with the diseases of animals has progressed; nevertheless, many were the occult devices employed to overcome disorders which now yield to very simple medication. By these occult devices, great cures were claimed; and then as to-day the public were as ready and eager to follow any self-styled healer who catered to the frailties of human nature either by ministering to their personal indisposition or to the illnesses of their live stock, for in many instances the health of the live stock was then as now more important than the health of members of their own families. Such practices have been responsible for the existence of empirics and charlatans, and who may say that their exploitation of the public has not been for the general uplift and improvement of educational methods? Who would dare, in the light of our present knowledge and the practices of to-day, to say that Paracelsus did not exert an important influence in stimulating those interested in the practice of human medicine to eliminate much of the mystery which then surrounded this art? He simplified many of the methods of dealing with disease, although it is generally admitted that he was an empiric. The existence of empirics and charlatans in the veterinary medicine of our day has exerted a very important stimulus toward the improvement of the courses given by veterinary colleges. Some veterinarians are continually waging war with a view to securing the elimination of empirics by legislative enactment, and this I believe to be a step in the right direction. A few are exceedingly jealous of the standing and success of the self-educated empiric, but I may state that the trained veterinarian who is unable to successfully practise his profession in the face of such empirical opposition has either entered the professional ranks improperly equipped, or else he has endeavored to engage in a science for which he is by temperament

and training wholly unfitted. We have passed the era when superstition reigned supreme and are now enjoying the fruits of a higher civilization than the world has ever known, expressed by the increased facilities granted for all forms of educational advancement. Veterinary science is coming to the fore, and ere long will assume the importance which the increasing value of live stock will demand.

Outstanding men appear from time to time who are courageous, yet sufficiently optimistic, to faithfully trust in the ultimate success of their efforts. Such men may bend their energies to the finding of a new land, the colonizing of an arid waste, the cultivation of the hitherto unknown, the discovery of new scientific facts, the practical application of existing knowledge, or they may stimulate others to a desire for familiarity with subjects formerly considered of little importance. All of such are pioneers and may prove martyrs, yes, heroes, to the cause of their choice, and time will emblazon their names in the eyes of future generations as indelibly as those of any hero of mortal conflict. Following the pioneers, there is usually a period of recrudescence, during which the real development takes place, and among the men who accomplish this development are staunch men of the pioneer type. These men under other circumstances and environment would doubtless be pioneers, and yet who may say that their efforts in building upon a solid foundation are not the equal of the true pioneers, though less spectacular?

Veterinary education, commencing as it did at a very early period from our standpoint, possessed its pioneers whose names are more or less familiar to us all. Others have endeavored to complete the tasks which they commenced, in some cases under very arduous circumstances, and the little advancement made has been comparatively recent. But few men were concerned with this advance in North America, and most of them have gone beyond, yet those still with us are respected among their professional *confrères* and by others who have enjoyed their acquaintance.

We, in Canada, are most intimately concerned with the status

of veterinary education within our own borders, as we are more vitally affected by conditions which reflect upon our own energies, than by circumstances which have but a remote bearing on our well being. With this reflection we must carefully consider what the great universities of this land are doing for veterinary education, and determine whether or not they are living up to the traditions of the individual institutions in other phases of advancement. We can justly lay claim to the first institution which considered it necessary to extend the course of study from two to three years, at a time when other colleges believed two years sufficient in which to give an adequate training. This one act on the part of the far-sighted dean of the School of Comparative Medicine and Veterinary Science of McGill University, Dr. D. McEachran, has borne fruit, and there is not now a recognized school on this continent or elsewhere which considers less than three years adequate, in fact, a great many colleges whose courses now extend over four years are considering the advisability of adding another year to their curricula. Such is the trend of modern thought along all educational lines, and to those who are assisting in the maintaining of lowered standards in any of the veterinary colleges, there should be extended the severest condemnation from their colleagues.

We cannot go farther without mentioning the name of Professor James Law, so long connected with Cornell University, who successfully placed veterinary science in New York State, from a legislative and educational standpoint, on an equal footing with human medicine, at a time when schools within that state were not equipped to meet the high standards demanded by legislative enactment. This advance has stimulated other states in the Union to an increased effort, and the federal government, through its Bureau of Animal Industry, indicates those institutions whose curricula are such that they may be expected to develop men suitable for service in the special work of the Bureau. Canada is forging ahead, and the examination required for entry into the Health of Animals Meat Inspection Service, is a step in the right direction, but the progress is slow and the

schools are not provided with sufficient funds to meet the demands of present-day educational requirements.

As a profession, and I believe that trained veterinarians are professional men of the highest order, a greater amount of time is demanded in the study of its many branches than is required for proficiency in any other line of endeavor. That there has been a tendency on the part of some of those financially interested in the exploitation of veterinary education to consider it as a trade rather than a profession, we are, perforce, compelled to admit. This tendency, however, has practically disappeared and the institutions now engaged in educating veterinarians are strengthening all phases of their curricula. As to the exact requirements and special training which may be insisted upon, there is naturally some difference of opinion. Each teacher considers his subject the fundamental one for the laying of a proper foundation; were it otherwise, the natural enthusiasm which should always exist would be wanting, and the details would be imparted in such a half-hearted manner that a student could scarcely eliminate the unimportant from the important features. If it were feasible, I would suggest that all desiring to perfect themselves as veterinarians should first take the prescribed curriculum in any of our leading agricultural colleges, after which they would be able to absorb the many intricate details in chemistry, physiology, anatomy, pathology and other subjects which vary with each species of animal that a trained veterinarian may at any time be called upon to treat. While such a scheme may be impracticable for immediate application, I am of the opinion that the greater portion of the agricultural college training connected with the feeding and breeding of live stock should be included in the curriculum. This with a training similar to that now given in human medicine at our leading universities, using the horse as a type instead of the human being, and supplementing such instruction by the inclusion of special features connected with the various species of animals, so as to ensure a complete familiarity with the most pronounced peculiarities of each, would materially assist in thoroughly grounding those electing to be-

come proficient in this art and science. After submitting to such an apprenticeship, the individual graduate would feel capable of successfully dealing with many disorders which now puzzle all but the most experienced. His powers of discernment and intuition would be so developed that the greatest barrier to success, that of proper diagnosis, would largely be removed through his being conversant with the idiosyncrasies common to each species of animal. In opposition to the above outline it may be argued that these requirements are being fulfilled to-day, but if this is so there are few schools which are meeting them in their broadest conception, and the highest practical development possible will not elevate in an excessive degree one who must be as versatile in his proficiency as the veterinarian should be.

Many are unaware that a veterinarian may, in an ordinary day's routine, be called upon to treat,—a hog, whose anatomical and physiological functions are very similar to those of man; a cow, with a very complicated digestive apparatus, requiring four stomachs and the usual complemental intestinal arrangements for the full performance of its functions; a horse, with yet another type of digestive system; a dog, whose digestive organs will readily assimilate bones and the innumerable ptomaines found in decaying meat; yet this is but a small list, for one might go on indefinitely detailing innumerable animals, including birds, which may be maintained as commercial assets, fancy stock or household pets. It may be pertinent to remark that the newly created fox industry, or the commercialization of foxes for their fur, is presenting problems of more than ordinary concern, if the final result of the experiment is to be a success from the financial standpoint. The turkey industry on this continent has been seriously menaced with extinction for the past twenty years by an infectious disease, and science has offered little to relieve the ravages thus occasioned. Fully trained men are required to deal with these and many other problems equally important. These references are extraordinary, but indicate certain ramifications of the science which must be provided for in the education of the modern veterinarian.

In view of the versatility demanded of the trained veterinarian, is it reasonable to expect that an ordinary mortal can in three or four years assimilate even sufficient basic knowledge for dealing with all or even a portion of these animals, when it requires five years in our best universities to perfect one's self in the art of ministering to the ills associated with the human species? Again, not only are we confronted with the variations which I have very superficially enumerated without specific detail, but we have variations in the action of drugs, a different series of contagious diseases, some of which may be intercommunicable among all or a few species, and last but not least, as a diagnostician, the trained veterinarian must determine the location of a disorder, not by interrogating the patient as is the case in human medicine, but by properly directed observation and elimination.

It was Hierocles,* who, at the latter end of the fourth or the beginning of the fifth century, indicated the difficulty of diagnosis in the following words: "In men there is an inborn faculty of speech by which they can express what is troubling them, nevertheless those skilled in the healing art consider the observation of symptoms necessary. How much more needful, then, must it be in veterinary practice to observe these symptoms of disease recognized as such by our traditional art in animals which are dumb by nature." In fact, there is practically no guide save the knowledge which is secured by the closest application, assisted by intuition, and accompanied by a natural aptitude for the work in hand.

From an environmental standpoint we are a meat-eating nation. We are not producing all that we consume in meat, meat food and animal products, yet we have one of the largest areas of fertile lands on the globe. The total value of live stock in

* *Ibid.* Hierocles is by some considered a lawyer, but his writings show that he was conversant, with a more than ordinary intimacy, with the veterinary art as it existed in his day, and in a manner which could be secured only by actual contact and practice with animals. Two books written by him were five hundred years later the basis of a work which was intended to perpetuate for all time the practice of the Byzantine veterinarians. The wording of the final sentence quoted indicates that the art of veterinary medicine had then been known for a long time.

Canada approximates seven hundred millions of dollars.† Basing the yearly loss at five per cent., which is a very conservative estimate, due to preventible causes, there is an economic loss to the country of thirty-seven million dollars per year. The cost to the country of the Health of Animals Service, whose duty it is to protect the animals of Canada from the spread of contagious diseases within its borders and the prevention of their entry from without, is but three hundred and twenty-five thousand dollars or considerably less than one per cent.

With this vast investment, it is apparent that the time is ripe for properly safeguarding this great live stock industry which is one of the principal assets of our country. Probably the best means of safeguarding this great interest is to see that adequate provision is made for the suitable training of such material as may present itself at the existing veterinary colleges. This raw material must first be equipped with the basic education necessary for the proper assimilation of such facts as may be presented in the purely technical studies required. Without such a foundation, the superstructure cannot be raised with a reasonable assurance that the individual will be capable of coping with the many problems presented to him after he has graduated.

Sufficient schools of a proper standard are not now available in Canada, therefore, we may ask, are our universities unequal to the task which is at their door? Other departments are being generously endowed and equipped, yet one of the most important phases of higher education is being silently ignored or overlooked.

\$5,000 FOR A CLYDESDALE COLT.—Fairholme Farms of New Jersey, the property of R. A. Fairbairn, announce the transfer to F. Lothrop Ames, of Massachusetts, of the ten-months-old Clydesdale colt, Fairholme Footprint. The price was \$5,000, a record for a colt of that age. Fairholme Footprint is one of the most sensationally bred colts of the breed. * * * —(*Breeder's Gazette*.)

† The Superintendent of Compilation of the 1911 Census, Mr. E. S. Macphail, has supplied figures from which the following values have been estimated: Horses, \$426,903,930; milch cows, \$123,362,225; other cattle, \$76,228,020; sheep, \$14,510,400; swine, \$24,914,714. The total figures for poultry are not available but are estimated at \$15,000,000. British Columbia figures are not available and are estimated at \$61,591,761. The total from these figures is \$742,511,050.

FUNDAMENTALS OF GOOD LIVE STOCK SANITARY CONTROL WORK.*

BY M. H. REYNOLDS, UNIVERSITY OF MINNESOTA AND STATE LIVE STOCK SANITARY BOARD.

The reasons for the existence of live stock sanitary control work are not many. I can think of but two. There is, first, the protection of human health against infectious diseases of lower animals; and there is one other reason, the protection of live stock from preventible disease and consequent losses.

Social and economical reasons for protecting human health are plain enough. Protection of live stock from infectious disease means the protection of our whole social structure, because a prosperous agriculture is absolutely essential to human well-being and in our country animal husbandry is absolutely essential to a prosperous agriculture.

No one can ever give us any reliable figures for value to the United States of the live stock sanitary control work which has twice eradicated foot and mouth disease. What financial statement can we ever have that will adequately express value to the South and through the South to the whole country, of original research work and subsequent control work which opened a way of eradication for Texas Fever, and which is now actually progressing at the rate of from 25,000 to 40,000 square miles a year. The eradication of pleuro-pneumonia from this country can never be valued in dollars and cents.

In this day no one can reasonably question a great need as justification for the existence of a well organized, well supported, and all around efficient state live stock sanitary control work.

PRESENT SITUATION.

Every honest veterinarian who has studied the sanitary control situation in many states knows that with a few exceptions

* Extracts prepared by the author from the original address before the Nebraska Live Stock Breeders' Association, Lincoln, January 21, 1914.

the situation is far from satisfactory. Only a few states have live stock sanitary control organizations that are capable of doing efficient work and these few states are widely scattered. Political machines that depend upon political favors and the avoidance of influential antagonisms rather than upon efficient service are only too common. Politics and sanitation, either human or veterinary, have never been and never can be mixed with results other than harmful.

The veterinary sanitarian, like the health officer, should be a trained specialist with permanent tenure of office if efficient.

State live stock sanitary control work is a job by itself. It is all nonsense; it is foolish to suppose that any veterinarian without special experience or training can step from busy private practice to state control work and give efficient service. It is folly to take a man from spavins and colics and pneumonia, make him state veterinarian by political appointment, and expect him to deal intelligently with general problems of state control work until after a very considerable amount of actual work and experience.

The probability of a man so appointed holding his position longer than one term depends, as a rule, not on his ability and efficiency as a sanitarian, but upon political skill and tact and upon ability to make a good bluff at doing something and at the same time be able to avoid antagonizing stock owners who may have political influence.

Efficiency in sanitary service is apt to make the executive officer unpopular. Efficiency and popularity frequently vary in inverse ratios.

It has been a matter of repeated experience in various parts of the United States that whenever a capable veterinarian was appointed to state veterinarianship under the old plan and then proceeded in good faith to undertake any large progressive work, he has been displaced about the time when his work began to look promising. Even if his successor had the necessary character and ability, he, of course, faced a new job which must be learned before his services would be of much value to the state.

Unfortunately students in our veterinary colleges receive but little useful training in sanitary control work and too many of them go into practice in country districts with very hazy ideas of how they are going to advise owners in case of an outbreak of a given infectious or parasitic disease.

The lack of original training makes it difficult to find veterinarians competent to take charge of state control work. The best that a state can do under present conditions is to select a broad-gauged veterinarian who is recognized as able and reliable and who has perhaps made good in private practice; put him in charge of state work and wait for him to learn the new job. If he undertakes any efficient work with the big new problems confronting him he soon realizes that it is decidedly a new job, and that the problems are very different from those which he met in private practice.

SUGGESTIONS FOR SOMETHING BETTER.

Any really successful live stock sanitary control work must have stability; must have freedom from political entanglements; must have adequate funds; must have public confidence and support in an unusual degree; there must be no possible suspicion of graft; and there must be in it a mutual co-operation of veterinary interest, and live stock interest. All experience in state work shows that efficient and valuable work is only possible where there is stability. Constantly shifting policies, a constant succession of new men learning the same job puts up an absolute bar against satisfactory progress in state control work. There must be defined policies, long time plans, permanence, public confidence, and legislative support, as fundamental necessities.

The only plan now in sight which, in my judgment, comes near answering to these requirements is that of a small non-political commission or board of about five members—stockmen and veterinarians. This board employs a trained veterinarian as executive officer; as well as the field veterinarians and other help, fixing the terms of office and compensations. By this plan it is possible to retain an efficient man in spite of political antag-

onism or to get rid of an inefficient man, no difference how much political support he may have. The board meets at infrequent intervals, say quarterly, and serves to decide upon general methods of utilizing funds; adopts general sanitary policies, and all rules and regulations. Board members do no field work; they must leave the detail executive work and the field work entirely to the man employed for this purpose, who operates always in the name of the board and according to general plans and policies previously approved by the Board. But one membership should become vacant each year, so that there is no opportunity under ordinary conditions for sudden changes in membership and reversals of policies.

The state board as thus far described, constitutes only a small central machine. With this there must be intimately associated under carefully worded provision of law, all local boards of health and health officers. It should be made the duty of local boards of health and health officers to co-operate with the live stock sanitary board. The board will thus have agents in every township, village, town and city of the state, for whom the law specifies certain duties and who can be called upon by the state any time for information or active assistance.

The first lesson our people must learn is that public sanitation can never be made to mix well with politics—in other words, public sanitation should be “out of politics” just as far as possible. The second lesson in this connection is that veterinary sanitary control work is a job by itself. An ordinary private practice, no difference how big or successful, does not fit a man for state control work even though he have natural ability. Vegetable gardening on a big scale does not fit a man for managing a western wheat ranch; practical work as a cabinet maker does not fit a man for work as a building contractor. In each case there are two different jobs in the same general field, each requiring special training.

The executive officer of such a board must, of course, have back bone and at the same time plenty of tact. He should be big enough to be worth a good salary and then he should be properly paid so as to hold his high grade of service for the state.

Board members receive no compensation aside from actual traveling expense to the board meetings. They have no pecuniary interest at stake in holding or losing board membership—are therefore in a position to stand firmly for policies that seem wise, and are able to go before finance committees with unquestionably clean hands.

If the board is to consist of five members, then three of these should be stockmen and two should be graduate veterinarians. The executive officer, always an employee, not a member, should be a veterinarian and the men doing actual field work must be veterinarians, of course.

Theoretically, stockmen memberships in majority would oppose progressive work with diseases like tuberculosis and glanders. As a matter of practical experience where this general plan has been tried, they never have stood in the way but have worked in perfect harmony with the veterinary members of the board. The general conditions of public interest and intelligence on this question is such now that stockmen board members never can stand long in the way of progressive work along these lines.

That this general plan of a small non-partisan board of stockmen and veterinarians has been working out most successfully in actual trial, was accepted by the United States Live Stock Sanitary Association at its Chicago meeting in 1910. There have been a few rare exceptions where a state veterinarian with great ability, unusual tact and a winning personality, has been the whole thing. These few men holding political appointments as state veterinarians have done good work. They started things; they did things. But in such cases it has been shown by subsequent developments that the successful state work all hinged on the one man's health and continuance in service—not upon the organization. When this one man has died or retired, the state work has usually taken a slump. The bottom fell out. All experience in state control work indicates the necessity of stable organization that does not hinge upon the continuance in office or the personality of any one man.

There are difficulties in the way of this board plan, but there are greater compensating advantages.

DIFFICULTIES.

Antagonisms.—A retarding factor all too common in veterinary control work on whatever plan, has been antagonisms between state veterinary sanitary work and agricultural experiment station authorities. This difficulty has cropped up in so many states that there can be no question of its presence or its importance. The explanation of this is easy and the remedy is easy. The two fields overlap. Two different state institutions receiving financial support from the same state legislature are trying to do the same work and easily become rivals for reputation and for support before the same public. There should be organic relation in the work. Certain lines of work may properly be done by either one and for this reason there must be mutual agreement with the general principle in view that the first and chief duty of sanitary authority is police control work—not research. In the absence of some organic relation there must be over-lapping, competition and antagonism, if both bodies are ambitious and active.

Future sanitary boards are going to need all the foundation and backing that can possibly be secured when they tackle the great problems of tuberculosis and hog cholera and glanders in earnest. So far, most state boards and state veterinarians have been only playing hide and seek with these problems of tremendous importance.

There must be harmony and co-operation in place of division and antagonism. This unity and co-operation must include more than the agricultural college and station. It must include live stock and other agricultural organizations.

If these two general propositions be true, then some at least, possibly a majority, of the board members should be there *ex-officio* to give harmony, stability and further freedom from political entanglement.

These *ex-officio* members should represent permanent and

influential organizations of stockmen and veterinarians. And the agricultural experiment station should be represented on the membership to secure harmony and unity of service in a common field, and to add in stability. I do not believe it best or desirable for an agricultural college to do the direct executive work except when political or other conditions make such arrangement imperative.

A sanitary board thus closely organized with such institutions as the state live stock breeders association, or agricultural college, or state dairyman's association, or state veterinary association would necessarily have greater stability, a more general public confidence, and immensely greater influence, than members selected at random by a governor or frequently by his private secretary, who may know little of live stock sanitary work or its needs.

Finding Executive Officer.—It is difficult to find a good executive officer for such a board. The only way we have at present of getting a good executive officer is to select the most promising veterinarian we can find in private practice; take him into state work, and train him for a new job. He must, of course, have energy, be capable of learning office methods; must be firm but tactful; must have brains and capacity for appreciating big problems and for dealing with general issues. It takes time to train such men for their work, but on the other hand if successful, he may be continued in office as long as the Board is satisfied with his work. Sudden changes in the political complexion of the state do not in the least affect his tenure of office or the probability of his being able to continue work under way.

Hybrid plan.—A few states have a plan that is a sort of unproductive hybrid—a cross between the state veterinarian plan and the sanitary board plan as approved by the United States Live Stock Sanitary Association. These states have a small sanitary commission, but their secretary is appointed for them by the governor under the title of state veterinarian. Serious weaknesses in this plan are self-evident. The executive officer so appointed may be entirely out of harmony with the policies of the

board. His retention does not depend upon giving satisfactory service to the board but upon ability as a politician. There is necessarily instability and frequent changes where there should be stability and permanence.

THE FUTURE.

The possibilities for future work with bovine tuberculosis are simply fascinating.

We have a large amount of reliable information concerning the disease. We have a simple, accurate and rapid diagnosis for it. We have the advantage now of many years of agitation and public education. The easy possibility of simple and comparatively rapid eradication from pure bred herds has already been demonstrated in a practical way. Breeders here and there all over this country are advertising tuberculin-tested, guaranteed tuberculosis-free herds. We have a considerable number of definite propositions in control work settled for tuberculosis. The field is ripe. The prospects are immense.

Infectious abortion is just beginning to be appreciated at its enormous importance. We already have two accurate means for diagnosis. We have an encouraging possibility in front of us for its seriousness and ready to co-operate. Breeders and even veterinarians did not concede its true importance. This field is already ripe now for the biggest and best work that any state live stock sanitary board can be made capable of doing.

Can there be any question but that the appropriations usually provided by states for veterinary sanitary control work have been inadequate and unwisely inadequate? Can there be reasonable doubt that money intelligently used by an efficient sanitary machine is capable of bringing to the state an interest yearly earned by other public investments.

Consider for a moment the entire livestock values of your state and their social significance. What in proportion would an annual appropriation of \$50,000 a year be for your sanitary control work?

An agricultural state can ill afford not to spend money gener-

ously to protect her live stock interests. Our appropriation is but a trifle in proportion to the interests which we are protecting with it.

In order to secure large and increasing appropriations continued through any number of years, it is absolutely necessary that the livestock sanitary authorities must do efficient and conscientious work. Funds must be handled with the most scrupulous honesty and managed so as to bring the best possible returns for the state making the investment. It is necessary for such authority to have the confidence and backing of livestock interests and veterinarians of the state. And it must be clear that large appropriations and important legislation are not for the board—clear that the board is merely an agent responsible for wise handling, and clear that funds and the benefit of what may seem strong legislation merely pass through the board to the livestock owner and a general public that is dependent on prosperous animal husbandry.

HE DRIVES A SHETLAND.—Big six cars may be all right for those who like them, but so far as President Vincent, of the University of Minnesota, is concerned a Shetland pony has more sense and is better company, according to the *Minneapolis Tribune*. That is why it is not unusual to see a little Shetland hitched to a go-cart standing in front of the administration building on the campus, while powerful automobiles sulk in front of it and behind it—the pony waiting for Dr. Vincent and the automobiles for regents or deans or just plain professors.

"Pinto" is the Shetland's name and he belongs to the youngest of the Vincent family. He is said to be extraordinarily intelligent, and to be able to detect sugar in an approaching pocket with a certainty that would do credit to a doctor of chemistry. Dr. Vincent has not yet ventured on the downtown streets behind the Shetland, but he drives behind him between his home and the university without any loss of his own dignity and considerably to the augmenting of that of the Shetland.—(*Our Dumb Animals.*)

DR. C. M. MCFARLAND HAS REMOVED from St. Joseph, Mo., to Spokane, Washington.

ANTISEPTICS VERSUS GERMICIDES.*

BY ROBERT T. MORRIS, M.D., NEW YORK, PROFESSOR OF SURGERY, NEW YORK
POSTGRADUATE MEDICAL SCHOOL AND HOSPITAL.

When we are giving information to royalty, it is customary to preface our remarks with the statement "as Your Majesty already knows," even though we are discussing so distant a question as that of partridges in America. When presenting notes on the subject of antiseptics versus germicides this evening to an audience of surgeons, I am stating only what your majesties already know, but commonly forget.

Protoplasm is the basic unit of organic life. Bacteria and the body cells of higher organisms both consist of protoplasm. Things which commonly injure the one commonly injure the other. Bacteria are simple morphologically, but complex chemically. The higher organisms consist of aggregations of single cells, each one of which is simple like the bacterium morphologically, but complex in its chemical relationships. In the course of evolution bacterium and body cell have come to be peers as a result of the struggle for existence.

Under ordinary conditions a very good balance of nature is maintained between bacterium and body cell. When the higher organism receives a wound, this balance is temporarily upset and the surgeon is called to the aid of the higher organism. He chooses one of several resources: 1. A germicide which is destructive to bacterium and to body cell equally, 2, an antiseptic which merely inhibits the development of bacteria, but is not injurious to their protoplasm or to that of body cells, or 3, saline solution with a salt content which makes it isotonic with the blood serum of man, or Ringer's solution containing various salts which are isotonic with human blood serum.

The time for employment of germicides is chiefly in that brief

* Read before New York Academy of Medicine (Surgical Section), December 5, 1913.
Reprinted from *N. Y. Med. Journal*, January 10, 1914.

interval between the receipt of a wound, and organization of effort on the part of body cells for purposes of defense. Germicides may also be employed for preparing the skin of the patient and the hands of the surgeon. As soon as the body cells of the patient have recovered from the shock of a wound, and have organized their defense, germicides may be equally injurious to bacterium and to body cells, with a certain advantage to be sure in favor of the patient, because there is the *vis a tergo* of his aggregation of body cells which continues to deliver energy to the body cells in the vicinity of the wound, and to their agents the phagocytes. The bacterium has to work alone, singlehanded.

In the course of an aseptic operation, when bacteria are mostly kept out of a wound, and likewise in open wounds in which the body cells have organized their defense, germicides may be extremely injurious. The surgeon is to depend instead upon antiseptics which are not germicides, or upon saline solution or Ringer's solution for mechanical cleansing purposes.

We first noted the harmful influence of germicides in abdominal surgery because the peritoneum so forcibly resents injury in the pretty protoplasm of its dainty endothelium. The surgeon has not been so alert in perceiving the kind of harm which follows carelessness in choice between antiseptics and germicides which are to be employed in external open wound treatment. Bichloride of mercury, carbolic acid, hydrogen peroxide and iodine are all germicides. They injure the protoplasm of the cells called bacteria, and protoplasm of our body cells. They are extremely useful in a small part of the surgeon's work when wisely employed. When employed in every day service by surgeons and by the laity as household remedies they may be extremely harmful.

The beef trust taught us a lesson. When dressed beef was immersed in very weak solutions of benzoate of soda, boric acid, or salicylic acid, it was found that saprophytes postponed their activities, even though the cells of the beef had lost their power of vital resistance. These simple antiseptics, which are nearly inert as germicides, will do for wounds what they do for beef.

In the presence of the body cells of a living organism they inhibit the development of bacteria until such time as the body cells have organized their defense. Paraffin oil, we have lately come to learn, may be grouped among the antiseptics which are not germicides. It does not destroy bacteria nor injure body cells, but bacteria will not grow well in its presence.

Under certain circumstances it is desirable for us to employ antiseptics which are not germicides, but which have the peculiar effect of stimulating the development of repair cells. In this class we find the anilin which in its purified form is known as scarlet red, and dioxychinolin sulphate, freed from its potassium admixture. Scarlet red may overstimulate, and must be employed with skill. Purified dioxychinolin sulphate [Dr. Morris was speaking of Chinosol as we have learned on inquiry. He gave the chemical name in addition, but the latter was the only one quoted when the manuscript was edited.], when used as we formerly used bichloride of mercury, in the same strength of solution, has a greater antiseptic power than the latter (according to the report of the Council of Pharmacy of the American Medical Association) and yet is a feeble germicide. Both these substances belong to the group chosen by the surgeon who wishes to employ an antiseptic which is not a germicide, and which at the same time has special function in stimulating the development of repair cells.

In the course of development of the principles of the third or pathological era of surgery, we were all so deeply imbued with the idea of assuring chemical destruction of bacteria and their products, that we overlooked the influence which germicides exerted in destruction of body cells and their agents at the same time. This influence had to be met by unduly prolonged effort on the part of the reserve energy belonging to the aggregation of cells constituting a higher organism. We ran afoul of Newton's third law. The germicides which became popular during the pathological era of surgery have now passed into household use, and on the whole may perhaps be said to do more harm than good. The repair of a wound is long delayed by continued employment

of such germicides as bichloride of mercury, peroxide of hydrogen and carbolic acid.

According to the principles of the fourth or physiological era of surgery, which is just now emerging, the idea is to turn the patient over to himself, to give him home rule in the simplest way possible and to aid him in meeting his hereditary enemy—the bacterium—with his own defense organs—the body cells—without making the task more difficult by employing germicide bomb shells which throw fragments into the ranks of enemy and friend alike.

THE REPORT OF THE VETERINARY DIRECTOR GENERAL OF CANADA, Dr. F. Torrance, under authority of the Canadian Department of Agriculture, has recently been received, and, as might be surmised, is a very complete statistical report of animal diseases existent in Canada.

DR. HARRY EVENSON HOME ON LEAVE OF ABSENCE: Dr. Harry Evenson, Wahpeton, North Dakota, who is in the federal service in the Philippine Islands, is home on a visit to his native state. We congratulate the doctor, and trust that every minute of his visit will be a pleasant one.

HORSE BREEDING IN MONTANA is the title of a report published as Bulletin No. 4 by the State of Montana Stallion Registration Board. The data for this report was compiled by Dr. E. H. Riley and Miss M. Kleven, and is a very interesting and instructive little book of more than 60 pages, illustrated.

NEW YORK STATE VETERINARY MEDICAL SOCIETY WILL HOLD ITS TWENTY-FIFTH ANNIVERSARY AT ROCHESTER, August 11, 12 and 13, 1914. This will be a jubilee meeting in commemoration of the organization of the society in that city a quarter of a century ago. In addition to the reading and discussion of papers, and the excellent clinics, both surgical and diagnostic (for which the New York State society is noted), an historical sketch of the organization and development of the society will be presented by a committee appointed by the president to prepare same.

SCISSORS AND TISSUE SEPARATION vs. THE KNIFE.

BY JOHN LYNN LEONARD, D.V.M., ASTORIA, NEW YORK.

Most of us have a hobby, as it is called, on some one thing or another in regard to our work; and sincerely believe that there is no other method equal to it.

My particular favorite happens to be the use of scissors in surgery in preference to the knife, and the separation of muscular fibres, whenever possible, instead of cutting them. Of course it is impossible to use the scissors in every case, but the numerous instances in which they may be used by one in the practice of handling them is amazing. Many of these are cases in which the average practitioner never even considers their value. A friend of mine who is a very prominent and successful human surgeon has used scissors as a general instrument ever since I have known him, and long before. No matter what the operation is, whether a serious laparotomy or merely a slight wound, the scissors are on hand and he never forgets to use them. While still a student I became interested in his methods and picked up a number of valuable points from him; the foremost of which, I consider his choice of instruments. At first I looked upon him as crank, but now I think I am just as much one.

The most prominent operations in which the use of scissors may play an important part, and in which the separation of muscular fibres may also be combined, are laparotomies of the various kinds. In these operations the patients should of course be fasted, purged and catheterized so that the abdomen may be empty and thus offer the least amount of resistance possible. After the anesthesia is complete and the field of operation is prepared in the usual manner the loose skin is seized with a pair of forceps and lifted slightly. Then, using scissors having one sharp pointed blade and the other slightly blunt, thrust the sharp pointed one through the skin and under it as far as the length of the intended

incision and make one clean cut. By this method there is not as much annoyance from cutaneous vessels owing to the pressure of the two blades upon them in opposite directions just before severing, especially if the cutting edges are slightly dull, which they really should be, for this work. The muscle now being exposed, the points of the two blades, closed together, are used to carefully separate the fibres from one another in their longitudinal direction down to the peritoneum and retractor forceps inserted to hold the two walls apart. Next force the blunt point of the scissors through the peritoneum at one end of the incision, then, making sure that no organs are in the way, insert the blade the length of the opening above, at the same time gently lifting the membrane as much as possible and make another clean cut, as through the skin at the beginning of the operation. The abdominal cavity is now open, and for whatever is to be done inside there is no better cutting instrument than a pair of scissors. The stomach, an intestine, or the bladder may be punctured and incised the same as the skin, and for excising a part they are far superior to the knife. For the latter work the curved scissors are the best and most convenient to handle.

I will now refer briefly to the two subjects separately.

For removing warts and tumors of the various kinds, especially those of the eyes or eyelids; amputation of the tail, toes and other small members; and for trimming ragged wounds the scissors are by far more preferable than the knife when one is in the habit of using them, and are much safer and more harmless to the patient in case of accident either on the part of the operator or that of the patient. In regard to the latter I consider them indispensable in laparotomy, as there is practically no danger of injury to an internal organ, which is so liable to occur with the knife.

Now as to separating the strands of muscular fibres in preference to cutting through them! When a mason builds a brick wall he mismatches his bricks that the wall may be strong and hold firmly together. It is the same with nature when she builds a muscle out of fibres. When the mason repairs a hole in the

wall he follows the same method as in building it; so does nature when she repairs an injured muscle. If the mason is compelled by some circumstance to place his bricks so that the ends come together in a straight line he has a hard time keeping them in place until the mortar hardens and even then there is a great weakness left. Exactly the same with nature. If her fibres are cut in a straight line and placed back together again in the same manner she is put to a severe test and finds it very difficult to hold the two smooth surfaces in place until she can cement them together so that they will hold. If, on the other hand, the fibres are carefully separated from one another in a longitudinal direction and then replaced in their original position so that they overlap each other she has very little trouble in binding them rapidly and safely together again. Furthermore, there is far less danger of hernia occurring after the operation, less danger of hemorrhage during it, and two muscles, one upon the other but running in different direction, may be penetrated in this manner by the aid of retractor forceps. To close the wound very little stitching is necessary, for, as stated above, nature is so assisted in her own method of healing that with the over-lapping and slightly swollen fibres firmly pressing against one another union readily takes place and very little mechanical aid is required.

As Mark Twain once remarked: "A man with a new idea is a crank until the idea succeeds." These ideas, however, are not new. They are old and have been in use by various human surgeons for years. Yet veterinarians, as a whole, seem to be very slow to adopt them, whether it be unwillingness to depart from former customs, unbelief, or neglect to try out that which appears new. But I am fully convinced that if one once becomes thoroughly acquainted with the above methods from a practical standpoint he will never depart from them.

NEW JERSEY STATE BOARD OF VETERINARY EXAMINERS will hold its next examination for license to practice veterinary medicine in the State of New Jersey, on Friday and Saturday, June 26th and 27th, at the State House, Trenton, commencing at 10 a. m.

REPORTS OF CASES.

PROLAPSUS OR EVERSION OF THE RECTUM IN A COLT.

By S. R. HOWARD, P.D.Q., Hillsboro, Ohio.

"In all science error precedes truth, and it is better it should go first than last." WALPOLE.

Subject was a fair conditioned long two-year old gelding, on thin and dry pasture, which co-exists with and often will cause prolapsus of rectum in horses and colts, and naturally I believed the pasture to be the cause of this case.

Rectum was everted to the size of a quart cup, greatly congested, slightly torn and bleeding, but seemed to cause no annoyance to the colt.

Rectum had been emptied manually.

The hair of dock was platted, and the eversion bathed for a considerable time with hot alum water, and at the same time subjecting it to pressure with hand cloth covered, thereby reducing and returning it, and which was then well greased.

Left large syringe with which owner agreed to inject the rectum with warm milky water several times per day. Should the part reappear (which it did occasionally) it was to be returned as had been done by myself. The colt was appropriately fed and allowed the liberty of a small pasture to keep up intestinal activity.

In about a week the prolapsus ceased reappearing and injections were discontinued.

The owner frequently reported that there never was a normal amount of feces in the rectum, and that when defecation occurred the pellets and the amount discharged were quite small and accompanied with unnatural straining. Owner had explored the rectum and was quite positive there was a very firm stricture in the bowel about the entrance to the pelvis.

I could not credit this last, but upon careful examination I found the stricture as he had described, having a foramen about the size of a silver dollar. No other change appeared to exist. This stricture undoubtedly had been caused by the repeated straining.

The first and second fingers could sweep around the inner sur-

face of the stricture which seemed to be about $\frac{1}{4}$ -inch thick, and could be somewhat dilated, but was extremely firm. The owner was instructed how to gently dilate it twice per day, which I am sure he attempted, but with no permanent effect.

I finally incised the stricture in several directions with a concealed embryotomy knife.

This was a perfect success and needed no further attention. During the following year request was occasionally made for medicine, "for his kidneys don't act right."

One cold rainy night I was called in great haste, "for that colt is going to die very soon if he is not helped." I found him sweating, standing with penis fully extended, grunting, straining violently, but no urine passing.

Manual examination discovered a hard body in urethra about 12 inches from meatus, and that the bladder was distended to its limit.

The storm was now at its worst and there was no time for an anesthetic or hunting for casting room.

We rushed a lot of implements off of the barn floor, improvised a casting rope, hurriedly threw and tied him, but not before warning the owner that the bladder might burst before we could relieve him.

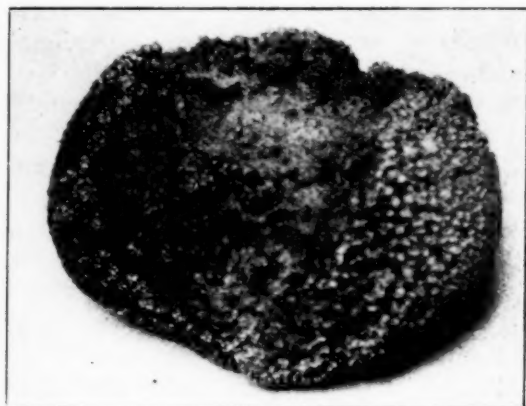
The penis was withdrawn full length, a handkerchief tied around it, and by the dim uncertain light of a broken smoking lantern and the use of a sharp jack knife this stone was cut down upon and removed.



The bladder then emptied itself with a gush. Circumstances discouraged me from further exploration of the urethra.

On rising he strained out a little urine, shook himself, and began eating. No stitching or after treatment given. Was put to work in three days.

Occasionally within another year owner called for diuretic medicine, and finally presented the colt for another operation, the owner himself having discovered the presence of the larger calculus at the ischial arch.



The above stone was removed, no stitching, but antiseptic lotion was prescribed for occasional application.

In three days he was again put to work and has been at it uneventfully for a number of years. Looks well and is a splendid work horse.

About that time, on an adjoining farm, I operated on an aged gelding at ischial arch for urethral calculus, the only restraint being a twitch. No stitching, immediate relief and rapid recovery.

Now, during the first visit to the case, had I passed the catheter, the cause of all following trouble would have at once been found. I can find no reference to urethral calculi being indirect cause for eversion of rectum.

However, it cannot be out of place in some cases of eversion of rectum to suspicion the presence of urinary calculi. The value of an examination for them is self-evident to me, now, but at that time I was in the dark.

I trust this report will help in the diagnosis of such cases.

"An idea belongs to the one who best can use it."

LOWELL.

A CASE OF CONTAGIOUS BRONCHO-PNEUMONIA CAUSED BY *BACILLUS COLI COMMUNIS*.*

By EDWIN M. STANTON, Detroit, Mich.

Hutyra and Marek¹ state that Enzootic Pneumonia of young animals is caused by the *bacillus bipolaris septicus* or its varieties. However, cases are on record where the disease has been due to an infection with the *bacillus pyogenes*, the *streptococcus pyogenes*, and by the bacteria of the colon group. It is further stated that in other enzootic diseases, as white scour and dysentery of sucklings, contagious broncho-pneumonia occurs as a secondary infection. E. Wallis Hoare² says that broncho-pneumonia is caused by a variety of organisms; the *bipolaris* being the most common. He states that the *bacillus coli communis* produces broncho-pneumonia as a secondary infection of white scour, and in the chapter upon white scour³ it is stated that the lung affection follows as a complication.

The statements of these two authors are exceedingly interesting. They show that it is possible for animals affected with a contagious intestinal disease to infect other animals with the organisms causing that intestinal disease, and that the latter animals may manifest entirely different symptom complex than that which existed in the animals primarily infected. The disease produced in the secondarily infected animals may involve a different anatomical system. In this way a secondary disease of a highly contagious nature is introduced into a herd. In other words, we have an organism such as *bacterium coli communis*, that is capable of producing in the animal economy two highly contagious diseases of a different nature.

During November of 1913, a section of lung was sent to this laboratory by the late Doctor Frederick H. Osgood, of Boston, Mass., with the request that a diagnosis be made. The history accompanying the specimen stated that the specimen was from a six months old calf, which had died, exhibiting symptoms before death of a disease which had affected 40 other calves upon the premises, resulting in the death of these animals.

The symptoms as stated were as follows: Elevation of temperature, discharge from the mucus membranes of the eyes and nostrils, loss of appetite, emaciation and respiratory disturbances, and death. It was stated that the disease occurred after the introduction into the herd of some thoroughbred Jerseys.

Gross Pathology.—The surface of the lung tissue was green-

* Research Laboratory, Parke, Davis & Co.

ish in color, roughened and covered with round and oval nodules about the size of a small pea. The nodules were soft, and when pressed a thick, creamy pus exuded. Upon cutting into the tissue the cut surface was of a dark red color. From the section of tissue, pus exuded. The tissue was heavier than water and non-crepitant.

Bacteriological examination.—Smears from the pus were made and when stained revealed a few streptococci and numerous short bacilli.

Agar plates were made from the pus in the usual way. One set was incubated aerobically, the other anaerobically. After 24 hours incubation both series of plates contained many colonies of bacilli. No colonies of streptococci nor staphylococci were observed on either set of plates.

Subcultures were made upon plain agar slants and incubated 18 hours. Microscopical examination showed that the cultures consisted of a short bacillus. The organism was then transferred to differential media consisting of agar slant, plain agar deep, glucose agar deep, plain bouillon, plain and litmus milk, gelatin, potato and fermentation tubes of glucose, lactose and saccharose.

DESCRIPTION OF ORGANISM.—*Morphological characteristics.*—A short, plump motile rod, which is gram negative, and does not form spores.

Cultural characteristics.—Plain agar, a translucent, raised, moist growth with wavy margins.

Deep Agar.—Translucent, confluent colonies along line of stab, and on the surface above the entrance of stab the growth raised and slightly grayish. A few gas bubbles observed in the body of the medium.

Glucose Agar Deep.—The growth the same as in agar deep. Medium, broken by gas formation.

Plain Bouillon.—Cloudy, viscid sediment formed at the bottom. A fecal odor was noticeable.

Plain Milk.—Coagulated, not digested. *Litmus Milk.*—Acid, coagulated. *Gelatin.*—Not liquified. Confluent colonies along line of puncture.

Potato.—Grayish white, glistening growth. *Glucose Bouillon.*—5 cm. of gas, acid. *Lactose Bouillon.*—1 cm. of gas, acid. *Saccharose Bouillon.*—.3 cm. of gas, faintly acid. *Durham's Peptone Solution.*—Indol formed.

From the cultural and morphological characters, the organism was identified as *bacillus coli communis*.

From the pathological condition of the section of lung sent

in, it was evident that a pneumonic condition existed. The symptoms stated pointed to a broncho-pneumonia, and from the bacteriological findings it appeared that the *bacillus coli communis* was the causative agent.

REFERENCES.

1. Hutyra and Marek: "Pathology and Therapeutics of the Diseases of Domestic Animals." Vol. II., pages 134-135.
2. E. Wallis Hoare: "A System of Veterinary Medicine." Vol. I., page 496.
3. Ibid., page 504.

DOG SWALLOWS TWENTY-TWO TACKS—RECOVERS.

BY ROBERT W. ELLIS, New York, N. Y.

The subject, a young Boston terrier, with an inclination to tear up things when left alone, in the absence of his owners one evening busied himself in tearing up the hall runner, removing and swallowing the tacks. On returning home and discovering what had happened, his mistress immediately counted the holes in the runner, which numbered 22 more than the tacks found, and on looking into the pup's mouth one of the tacks was seen well back towards the throat, which was removed before he could swallow it, and a message sent over the wire to me for assistance. The first step in the treatment was an emetic hypodermically, which resulted in the recovery of a couple of tacks. After the effect of the emetic had fully subsided, a half ounce of castor oil was administered and was retained. This was around midnight. On calling the next morning I learned that there had been no action from the oil and found the dog whining and stretching, and he refused to drink cream or partake of any food. Another half ounce of castor oil was administered; immediately after which the dog ate nearly two slices of bread fed to him by hand and drank a saucer of cream. The feeding of bread had been urged with the object of making material in the stomach to gather up the tacks so that they might be carried along with as much protection to the walls of the stomach and intestines as possible. They were large, heavy tacks, being $\frac{5}{8}$ of an inch long and very sharp, and I feared a terrible laceration of the walls of the intestines in their passage. So urged the continued feeding of as much soft bread as the dog would take, and he ate a considerable amount, as all other food was withheld. The results were very gratifying. He stopped crying after giving the oil referred to, that was followed by his eating a slice and a half of bread and lapping a saucer of cream; and a couple of hours later

had a bowel movement, passing three tacks without pain. He later vomited and brought up a tack or two after I had concluded that all the tacks had passed on into his intestinal tract. Was given more oil and fed more bread with gravy over it to induce ingestion of as much of it as possible. Second morning, had a movement in which nine tacks were present, with no pain, and finally the whole complement of twenty-two tacks were passed with seemingly no inconvenience, no laceration or bleeding, and the dog no worse for the experience. We published the report of this case, not for its scientific value, but that it may comfort some brother who finds himself in the same position with some other pet dog, possessed, like our patient, of more ambition than good sense.

TETANUS.*

By F. M. STARR, D.V.S., Odessa, Mo.

A very lame horse was presented for treatment and examination revealed a nail puncture wound in which there was much pus. Pure eucamphol was injected into the wound and the opening plugged with cotton, this treatment being repeated daily.

In about twelve days the animal was driven to my hospital, the owner calling attention to a general stiffness. As the animal neared the hospital I made a diagnosis of tetanus, as the tail was elevated and there was a very stiff gait. Examination of the eyes at close range was all that was necessary to confirm the diagnosis.

Three thousand units of antitetanic serum, intravenously, were given immediately, about noon, and the foot was placed in a poultice as soon as the animal got home. The patient was put into a dark stall by himself, but he was so restless alone that his mate was placed in the stall with him. In the evening another three thousand units of serum were injected.

Next morning the horse was so nervous one could not touch him, and further hypodermic treatment was omitted. He was so discontented in the stall he had to be turned out into the barn lot, which was within two hundred feet of the railroad. The case looked hopeless, so I decided to treat the wound only and applied pure formaldehyde into the nail puncture and plugged with cotton. The formaldehyde caused a great amount of sloughing, and pus even broke through and discharged at the cornet, yet the horse got well in spite of the treatment and without permanent lameness. The case ran a course of about four weeks. Disposition did not seem to have any bearing on this case as he was the most nervous horse I ever had in my hands.

* Reprinted from Kansas City Veterinary College Quarterly (March, 1914).

CYCLOPIA OR SYNOPHTHALMIA.

By CHESTER L. ROADHOUSE, D.V.M., Berkeley, Cal.

Cyclopia or synophthalmia is a deficient separation of the ocular vesicles, due to stunting in the development of the anterior



of the three cerebral vesicles. The malformation in this case has taken a very severe form as the nostrils and a portion of the

upper jaw are entirely lacking. It will be noted that although the ears and head resemble a colt in appearance, the white markings are suggestive of the head being that of a calf. The following letter was received with the specimen which was sent to the Veterinary Division of the University of California by C. P. Tolman, M. D.

"Mr. Hansen, of Watsonville, California, who gave the *colt's* head to me stated that the colt was born alive about nine years ago. He stated that the colt was unable to stand but was floundering around the yard and after about two hours he decided to kill it. The remainder of the body was perfect to all outward appearances. He also tells me that the mare was foundered and that they had a cow on the place that used to try to hook the mare while she was in her early pregnancy, and he ascribes the similarity in markings to a calf as a birthmark."

CANCER IN A CHICKEN.

By G. H. CONN, D.V.M., Prairie Depot, Ohio.

A large, healthy looking cock was slaughtered and dressed for table use, but upon evisceration the liver was found to be several times its original size and of a mottled appearance. Under the microscope this proved to be a cancer of the soft variety, containing very little connective tissue and hence very friable; the cells contained a very small amount of cytoplasm and large nuclei with cell inclusions.

The only case of cancer in birds I have ever known of and have been unable to find reports of any such cases in the history of veterinary medicine.

A GOOD EXAMPLE.—John D. Rockefeller, Jr., drives a pair of trotting-bred high steppers from his New York residence, in East 54th street, every morning and in all sorts of weather, to his office at No. 26 Broadway, a distance of five miles. If other men of large affairs would but follow the younger Mr. Rockefeller's lead, instead of riding to business in heated limousines, they would arrive there in a happier frame of mind and their nerves, doubtless, would more readily stand the strain which accompanies the busy life of money getting.—*Spirit of the West*.—Clipped from *The Horse Lover* for April, 1914.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

A SECOND ATTACK OF TETANUS [*Ernest Morgan, M.R.C.V.S.*].—Without showing any wound to account for the entrance of the microbe, a black, well-bred hunter, aged nine years, after having been hunted three days before, had a marked attack of tetanus. Put in slings, he received for seven days a daily injection of *Tetalin*. At first he seemed to grow worse, but on the eighth day showed improvement and finally got well. He was hunted again and sold.

A year after, the horse had a festered corn which was treated by the blacksmith. The history goes that a few days after he again was taken with unmistakable symptoms of lockjaw. He was put in slings again and submitted to the same treatment. The seven first days remained in the same condition, and it was only a few days after that the jaws became relaxed, and that the horse could be left loose in his box, and finally recovered.—(*Vet. Rec.*)

CONGENITAL OPACITY OF THE CORNEA [*J. B. Hare, M.R.C.V.S.*].—This peculiar case was observed in a litter of cocker spaniels, four in number, for which the writer was called. All pups were in good healthy condition. Two were blacks and two browns. One black had complete opacity of both eyes; in the other black it was only partial, in both eyes also; of the browns, one showed slight marginal opacity of both eyes, and the fourth puppy was free from disease. The father and mother had normal sight. A weak collyrium of nitrate of silver was prescribed without result. The black pup that had double opacity was destroyed. The other kept under observation. Sulphate of eserine had been suggested as a possible good treatment.—(*Vet. Journ.*)

SARCOPTIC MANGE OF DOG TO MAN [*John Buscomb, M.R.C.V.S.*].—The case is published to make the possibility of transmission from dog to man more generally recognized.

Some Pomeranian puppies had distemper and were also scratching themselves very much. They did not do well first

with the distemper and the diagnosis of sarcoptic mange was confirmed and treated accordingly. The maid who took care of them and nursed them caught the mange and the neighbors to whom they were given afterwards became also mangy after a short time.—(*Vet. Journ.*)

TRUE HERMAPHRODITISM [*Prof. F. Hobday, F.R.C.V.S.*].—Nine-year-old fox is brought for treatment. He has acute cystitis. Attempts to pass catheter failed. The urine is withdrawn through the abdominal wall with trocar. Death takes place after twelve hours. Externally, there was a well-developed penis of male, but no visible testicles. There were twelve symmetrically arranged teats as well developed as in a female of that age. The fox raised his leg like a dog when passing urine, though sometimes squatted like a bitch.—(*Vet. Journ.*)

FRACTURE OF INCISIVE TEETH IN HORSES [*Capt. J. R. Hodgkins, F.R.C.V.S., A.V.C.*].—Cavalry horse received a kick in the mouth from another horse. Result incomplete fracture of the upper central incisors close to the alveolar margin and exposure of the pulp. The teeth were driven back towards the roof of the mouth. Extraction was decided. Horse is anesthetized with chloroform, absorbent wool was placed across the bars, the jaws fixed by winding webbing round, the surgical area was cleaned, and the head propped up with usual straw-stuffed bag. The gum and mucous membrane was dissected as far as necessary, periosteum scraped and the anterior alveolar plate of the two teeth was cut off with chisel, exposing the entire length of the root of the teeth, which were then easily removed. The wound was trimmed, the edges smoothed and flushed out with permanganate of potash solution. The author gives credit for this simple operation to the work on *Animal Dentistry* by *Prof. L. A. Merillat*, which he had consulted.—(*Vet. Rec.*)

DIFFERENTIATING TUBERCLE BACILLI FROM THE MORE COMMON ACID-FAST FORMS [*G. Gair, M.R.C.V.S.*].—To determine the presence of tubercle bacilli in milk and excreta from other acid-fast organisms, such as timothy grass bacillus, dung and butter bacillus, the writer proceeds as follows: "I make my films and smears in the usual way, care being taken to spread the material uniformly and thinly. They are then stained with hot carbol fuchsin, the films are then immersed in boiling water for 2 or 2½ minutes without being treated previously with any discolor-

ing agents. The slides with films of timothy grass, dung and butter bacillus thus treated are found to be decolorized, but the tubercle bacillus retains its stain even after $2\frac{1}{2}$ minutes immersion. In some of the slides I met an occasional tubercle bacillus even after boiling three minutes. If a film treated in the same manner and boiled from 2 to $2\frac{1}{2}$ minutes still shows stained bacilli, those may be safely put down as tubercle bacilli."—(*Vet. Rec.*)

MITRAL DISEASE IN THE HORSE [*E. Wallis Hoare, F.R.C.V.S.*].—Twenty-five-year-old hunter has been, up to lately, in apparent health, having only on few occasions œdematous condition of the sheath. Now he is emaciated, has capricious appetite, an œdematous swelling is between the fore limbs, has a slight œdema along the abdominal region, the sheath is swollen also. The pulse is difficult to count, is irregular and weak. Respiration accelerated. Occasional cough is present, visible mucous membranes pale. Auscultation shows marked irregularity of the cardiac impulse. At the apex the sounds of the heart cannot be clearly differentiated from each other, the action of the heart is tumultuous. Towards the base of the heart, loud grating bellows murmur, systolic in character, is detected, it conceals the first sound, the second sound is much louder than normal. No increase in the area of cardiac region. Distinct pulsation is clearly visible towards the base of the heart. Jugular pulse on both sides. No treatment is prescribed, the animal was destroyed. Post mortem revealed: Enlarged heart, left auricle much dilated, mitral valve thickened and hard, cauliflower growth between the insertion of the chorda tendineae, left ventricle hypertrophied.—(*Vet. News.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

INTERESTING CASE OF OSTEITIS SEQUELAE OF DISTEMPER [*MM. Bordenave and Camban, Army Veter.*].—A mare, seven years old, pure Anglo-Arab breed, had distemper. She remained thin and delicate. She had a cutaneous manifestation, where she lost her hairs almost all over the whole body and recovered. For the following three years she had articular synovitis of the hocks which disappeared. She has had fistulous withers which remained more or less rebellious to treatment and finally she now

has all the manifestations of osteitis. There are exostosis at various points of the skeleton. Large on the inner face of the tibia, they are enormous on the right. The hock in that region measures 57 cm. round. On the opposite leg it measures 43. Both large metatarsal are deformed by the presence of exostoses. There is also a large one at the inferior extremity of the right fore-arm. The internal condyle of the right femur is large also, and there is one as large as a child's fist on the sternum at the girth seat. All those are painless. It is peculiar to notice that as these exostoses began to make their appearance, the condition of the withers improved, and radical, spontaneous recovery took place.

CHRONIC PYOMETRY [*Directeur Herbert*].—Ten-year-old cow, apparently in good health, has had for several years abdominal pains. She is a strong animal, does hard work, and her appetite has always been good. She shows, when examined, the symptoms of chronic peritonitis with fluid in the abdomen. She died, was examined, and the cause of her peritonitis was made out. There was nothing wrong in the digestive organs. The uterus was very large, weighing seven kilograms. It had on the inferior and median part of the body a large ecchymotic spot, with a circular ulceration about 10 cm. in diameter. The internal face of the uterus had no cotyledons; there was no communication with the vagina; there was no neck of the uterus, and the vagina formed a true cul-de-sac of very large dimensions. The histological study of the walls of the uterus showed the lesions of chronic suppurative metritis. As there was no communication between the uterus and the vagina, there was then pyometry.—(*Journ. de Zoot.*)

CHONDROMA OF THE FINGERS [*Prof. Dr. V. Ball*].—The author says: "I have had occasion to observe a case of chondrosarcoma of the finger, with numerous visceral metastasis, in a ten-year-old dog. The small toe of the right hand seemed reduced to the first phalanx, which, at its free extremity, had a neoplasm, widening in its form, largely ulcerated on its surface, granular and inflamed. The tumor was hard, and on section, the surface has an aspect cartilaginous, viz.: the characters of a chondroma. The growth measured 4 cm. in length and 5 in width. The post mortem revealed besides the presence of metastatic centers in the lungs and kidneys also one in the pancreas. The histological examination revealed the true nature of chon-

drosarcoma that some authors consider as cartilaginous sarcoma.—(*Journ. de Zoot.*)

GENERALIZED POROCEPHALOSIS IN A CYNOCEPHALUS [MM. Query and Brocq-Rousseau].—At the post mortem of cynocephalus, larvae of a species of lingatulidae are often found and which belong to the gender paracephalus of Humboldt.

Generally a small number only is found disseminated in the peritoneum, free or imbedded in the omentum or mesentery. Very seldom they are found in the liver or in the lung. In the majority of cases the authors have observed that their number is restricted and seldom more than ten are seen in one subject.

In the case that is recorded and illustrated the peritoneal cavity had a peculiar granulous aspect specially on the surface of the intestine. The granulations were formed by porocephali. There were hundreds of them, lodged in the omentum and mesentery. Some of them were also free in the peritoneal cavity. The larvae were rolled upon themselves, a few only being half or entirely unrolled. In the spleen and the liver as well as on the diaphragm there were a few. The kidneys and heart had none.

The case is exceptionally rare.—(*Revue de Pathol. Comp.*)

SEPTIC GANGRENE IN COWS [Mr. Marquet].—*First Observation:* Between seven and eight years old, a cow, in a good state of health, had for about a year on the posterior border of the left shoulder an oval tumor which was fluctuating. With the trocar a fluid, honey-like in consistency, is obtained; but a free incision is required to empty the growth. Between one and two litres of thick, white, yellowish liquid are removed. Small arteries that have been cut give an abundant hemorrhage, difficult to control. The wound is closed with sutures. The next day the growth is as large as before. The sutures removed show the cavity filled by thick exudates; there is no suppuration, and the edges of the wound are dry. No bad odor. Two days later gangrene is manifest. No suppuration, blackish edges of the wound, infected smell, crepitation round surface, general condition bad. *Death.* *Post mortem:* The general lesions of infection.

Second Observation: Cow has prolapsus uteri. It is reduced and to hold it in place two stitches in cross are put on the vulva. Through the expulsive efforts of the animal, one suture has torn one of the vulvar lips; otherwise the animal seems doing well. The next day the vulva is swollen, sore to the touch. The uterus contains fluid which is washed out with permanganate solution.

Dressing with tincture of iodine. The condition keeps on getting worse, and on the third day death takes place, with lesions similar to those of the first observation.—(*Rec. de Med. Vet.*)

DRY AND ASCENDING NECROSIS OF THE SEPTUM NASI AND TURBINATED BONES IN A HORSE [*J. N. Ries*].—Mare roars and has a puffy swelling round the nostrils and lower part of the face above the nasal spine.

The septum nasi is perforated by an ulceration running as high as the lower extremity of the turbinated bones, which are also invaded by the diseased process. The ulcer is bound by a yellowish line surrounded by a red border. This line represents the limit of cartilaginous slough, perfectly dry, and without separating edges, nor greenish coloration, as is usual in cases of necrosed cartilage. This ascending necrosis, destroying slowly, does not affect the animal which is otherwise in good condition. The lymph glands of the maxillary space are slightly swollen. Trepanation of the face over the nasal bone permits free irrigations which gave fair results, but in the presence of a long treatment the owner decides to have the horse slaughtered.—(*Rec. de Med. Vet.*)

OUR COLLEAGUES IN THE AMERICAN ARMY is the title of an editorial in the April number of our esteemed contemporary, the *Veterinary Journal*. Our English neighbors in the profession express astonishment that "a great civilized country like the United States has for so long persistently refused to grant what even the turbulent Balkan States consider a necessity," and suggest as one way to bring the United States to a realization of the value of the veterinarian, not only as doctor for the horses and mules, but in the capacity of inspector of animal food products, would be for "all the qualified veterinarians to hang together and all firmly boycott the Service." The editorial says in conclusion: "We, their British colleagues, can assure them, from our side of the water, that they have for a long time had our earnest sympathy, and that we wish them the greatest possible success." We can assure our British cousins that their good wishes are warmly appreciated by American veterinarians, and that we are very hopeful of success at present.

DR. KUHNS GOES TO WILMINGTON.—Dr. J. R. Kuhns, secretary of the Delaware State Live Stock Sanitary Board, has left Dover and located in Wilmington, that State.

BIBLIOGRAPHY.

VETERINARY HYGIENE.

(German.)

VETERINARY HYGIENE—OUTLINE OF THE CARE AND FEEDING OF DOMESTIC ANIMALS. By Dr. Martin Klimmer, Medical Councilor, Professor of Hygiene, Director of Hygienic Institute and Institute of Infectious Diseases of the Royal Veterinary College of Dresden. Second revised and enlarged edition with 207 illustrations. Berlin, P. Perry, 1914. Price 15 marks.

Klimmer's Hygiene is a recognized textbook, in which the more modern principles of feeds and feeding and the care of animals have been embodied. The scientific feeding based on Kellner's Comprehensive Studies on Animal Feeding was included in the first edition of Klimmer's Veterinary Hygiene, which he published in 1907.

In his second edition, Klimmer has revised his work and added two new chapters in order that it may comply with the practical requirements for veterinarians engaged in breeding and care of stock, also that army veterinarians may use it to advantage. The new chapters include the examination of feeds and descriptions of infectious diseases, which of course are only briefly described, since special publications deal more comprehensively with this phase of the subject. The author, in the chapter on infectious diseases, touches on the etiology and pathogenesis of these diseases and only mentions the treatment. On the other hand he discusses comprehensively the hygienic conditions which influence the resistance of the animals as well as the methods of disinfection. Another advantage of the second edition is the bibliographical data which appears at the end of each chapter.

The second edition is considerably enlarged. It contains 509 pages, divided into 10 chapters, and also contains an appendix. The first chapter deals with the air, the second with the soil, the third with the hygienic importance of water, in the fourth chapter the author discusses feeding, in the fifth he describes the injurious conditions which may be brought on by the feeding of substances containing poisonous plants and also food which has been adulterated or which contains impurities, or which as a result of various conditions has become spoiled. The sixth chapter contains the rules of general feeding, also the rations required by the different food animals according to Kellner's principles. The seventh chapter discusses the nursing of animals and other care and the

hygienic importance of pasturing. The ninth chapter contains a large amount of new material and stable hygiene; finally, the last chapter includes infectious diseases. The appendix of the book contains tables which furnish the raw and digestible organic material of the different food substances, also the starch values and the amount of ash. The 207 splendid illustrations enhance greatly the value of the book.

From this brief statement it may be seen that the author has included in his work all phases of animal hygiene. With this subject continually gaining in importance in the practice of veterinarians, the book of Klimmer will furnish the veterinarian highly valuable information, especially since the practitioner of to-day and of the future will not be called upon to treat diseases exclusively, but also to furnish data on questions pertaining to animal hygiene.

ADOLPH EICHORN.

VETERINARY ALUMNI OF NEW YORK UNIVERSITY.—In view of the fact that the New York State Veterinary College at New York University will have completed its eight months' course on May 25, the executive committee of the alumni association of that school, at its meeting on March 25, voted to hold the annual meeting of the alumni association on June 10, Commencement Day. The plan is, to hold the veterinary alumni meeting in the middle of the day (to be called about 11 a. m.) at the old veterinary college building, 141 West 54th street; so that on adjournment, the veterinary alumni may have an opportunity of joining the alumni of the other schools of New York University at University Heights in the afternoon to participate in the commencement exercises. The dinner of the veterinary alumni association will be held that evening.

This arrangement was made for the benefit of out-of-town men, who never get an opportunity to visit the beautiful campus and buildings of New York University and witness the imposing commencement exercises in connection with the graduation of the classes of its numerous schools. A communication from the secretary relative to this matter will reach each alumnus of the veterinary school, and we trust that as many as possibly can, will arrange to give themselves a day in the big city on June 10, and will visit the great university, of which their school is a part. Get the university spirit, it is inspiring!

CORRESPONDENCE.

PITTSBURG, PA., April 4, 1914.

Editor of AMERICAN VETERINARY REVIEW:

Dear Sir—I was much interested in Dr. Gilyard's report of the use of his method of treating a case of impaction of the caecum by the introduction of quantities of water through a trocar into the impacted mass. The results he obtained, I think, fully substantiate what I predicted in a recent communication. He obtained good results as far as he went, *but* he did not go far enough. I think that the further treatment which I indicated is very necessary to a complete recovery, as it is only by this means that the caecum can be made nearly empty, by which I mean that it shall contain largely a gaseous content, and not water free from solids. This condition is very necessary to recovery.

To examine the case reported, I think that the doctor was able to remove most of the solid content, at least all the solid material was gone as far as he could reach, but there is a grave doubt about the region at the apex being empty, as some sediment would settle at that point when the fluid was not being violently agitated. The caecum itself was still filled with fluid, as the doctor could find "no solid ingesta in the caecum," and this produced the old enemy I spoke of before—pressure, with the consequent inertia of the walls. Therefore he had progressed but not so far as to offer any chance for the circulation in the walls to re-establish itself, and for the muscular walls to regain their tone.

Some will think that the fluid in the caecum after the first operation would be absorbed by the walls, as is the physiological process in other parts of the bowels, but I do not think that this could take place; as the circulation is so greatly impeded and with the mucous walls in the condition that they are, no absorption could take place.

A question crosses my mind: What is the difference between cases of impaction of the caecum in Eastern and central United States horses and those cases seen in horses in the Northwest? When horses in the Northwest recover from the trouble (60 per cent.), whereas the other horses *all* die, in both parts of which

country the same routine treatment is being used and has been used for years, there being nothing about the Western treatment that has not been known, used, and found hopeless by Eastern veterinarians, for years? I dunno?

Yours very truly,

A. C. WIGHT, D.V.M.

COLORADO SPRINGS, COLO., April 7, 1914.

Editor, AMERICAN VETERINARY REVIEW, *New York*:

Dear Sir—Regarding Dr. Wolf's inquiry for a deodorant, will say that for many years I have used mustard. Just plain, dry mustard. Take a small quantity in your hand, moisten to a paste and use it as you would use soap; and you will certainly get rid of such odors as Dr. Wolf describes.

I do not claim originality for this. I just learned it somewhere, and so long ago that I really do not know where or from whom.

Truly yours,

A. J. SAVAGE.

GARRISON, N. D., April 22, 1914.

Editor, AMERICAN VETERINARY REVIEW, *New York City*:

Dear Sir: On page 107, April issue of REVIEW, Dr. Chas. F. Wolf, of Pioneer, Ohio, asks for a deodorant for removing foul odors from the hands after coming into contact with decayed or putrified tissues.

I have found the following very effectual, especially after trephining of decayed frontal tissues or for teeth, where the most disagreeable odors cling to the hands: Wash the hands in a solution of permanganate of potash in water which will deodorize, and then to remove the resulting stain, rinse in a solution of oxalic acid in water.

I am not particular about the strength of these two solutions, as I have not experienced any irritating effects from either, and a last washing with soap and water will remove all traces of the oxalic acid, and should slight traces of the permanganate stains remain I think you would prefer it to the odor. Try the above and I believe you will get results.

Yours fraternally,

J. W. ROBINSON.

ARMY VETERINARY DEPARTMENT.

BRITISH VETERINARY OFFICER OF HIGHEST RANK TELLS EXPERIENCE OF BRITISH ARMY VETERINARY DEPARTMENT.

THE DEVELOPMENT, ORGANIZATION, METHODS AND WORK OF THE BRITISH ARMY VETERINARY SERVICE.

By MAJOR GENERAL ROBERT PRINGLE, Director-General, British Army Veterinary Department, War Office, London, England.

Letter from General Pringle:

War Office, 23d March, 1914.

DEAR SIR.—I am sending you a short article on the history of the Army Veterinary Corps in the English Army, which I hope will be of some service in helping you to obtain recognition of the veterinary service in the United States Army.

Yours sincerely,

(Signed) R. PRINGLE.

To GARRISON STEELE, Esq., M.D., D.V.M.

Veterinary surgeons were appointed to cavalry regiments in the British Army in the later part of the 18th Century. They were originally employed on the recommendation of a Committee of General Officers because of the enormous losses amongst army horses.

Their appointment was productive of much benefit to the service, in as much as glanders, of which military stables used to be hotbeds of the disease, was soon entirely eradicated, and the death rate within less than two years was reduced fifty per cent.

In those days the veterinary surgeon was a regimental officer. He was responsible to no one but the commanding officer for his duties. No other regiment and no other branch of the service had a call on his services in peace or war. Some spent the whole of their service at home, whilst others became prematurely old and infirm through living most of their lives in unhealthy climates abroad.

This was considered unsatisfactory, and in 1881 the veterinary service was organized into a special department, all regimental appointments, excepting those of the Household Cavalry,

being abolished. The officers were placed on a seniority list and a roster for foreign service under one central authority. A special uniform was adopted and they were attached to cavalry regiments, or units, for duty as their services were required.

The subordinate staff for carrying out the instructions of veterinary officers regarding the treatment of the sick belonged to regiments. These men were originally trained as cavalrymen, gunners or drivers, after which they spent two years or more in the forge learning to shoe horses. They were afterwards trained to look after sick animals.

This method of dealing with the sick was ample for peace requirements, but on service it was a complete failure, as the men trained in the above mentioned manner were required by units in the firing line for fighting, shoeing and attending to trivial ailments which would not preclude horses from doing their ordinary work.

The more serious cases requiring rest, extra food and daily veterinary attendance could only be treated in hospitals on the lines of communications, and our peace organization provided neither hospitals nor personnel.

This was the state of affairs at the outbreak of hostilities in South Africa in 1899, and to overcome these difficulties the Government had to apply to India for veterinary hospitals with trained native personnel under British veterinary officers, and also engage and train civilian subordinates during the war at high rates of pay.

The results were anything but satisfactory, and evoked severe comment from every direction. It was impossible for units to look after their sick horses on the march and they had to be sent to hastily improvised veterinary hospitals on the lines of communication. Many horses died which otherwise would have recovered. This would have saved the country the enormous expense incurred in replacing them with remounts. A recovered horse is far more valuable than an over-sea remount in that he is usually acclimatized to the country in which he is serving, and, further, he is a trained horse.

The chaos which resulted accentuated the fact that every branch of the army, no matter how small, must have a peace, system of training, modelled on lines similar to those which will be in force in war. In 1902 a committee assembled to enquire into the conditions affecting the army veterinary service and to suggest remedies. The principal recommendations were the formation of an army veterinary corps of non-commissioned offi-

cers and men to assist veterinary officers in the discharge of their duties, and the grant of combatant rank and titles to the latter. This was granted by the royal warrant of 5th October, 1903, and soon afterwards veterinary hospitals were established in the large military stations in the United Kingdom and in South Africa. A section constituted a unit, its war establishment being fixed at 2 officers and 113 non-commissioned officers and men.

Veterinary officers are detailed for duty with the various units of the army, and to them is confided the veterinary supervision and care of animals. They make frequent inspections for contagious disease, and bring to the notice of commanding officers any measures necessary for the health and condition of the animals under their professional care. They superintend the dressing of simple cases by the regimental staff of units, sending the more serious ones to hospital for treatment.

With a view to forming a reserve of officers to come to the assistance of the army in time of war, two officers' training corps have recently been organized at the Royal Veterinary College, Dublin, and the Royal (Dick) Veterinary College, Edinburgh. Students are drilled and receive instruction on military organization and discipline, especial attention being paid to that which applies to the veterinary service. Selected candidates, after qualifying, receive commissions in the special reserve of officers and undergo a further course of instruction for three months at the Army Veterinary School and in a veterinary hospital. During this training they receive the pay and allowances of their rank, and receive in addition an annual retaining fee up to the age of 40.

The veterinary service of the territorial force, which hitherto has been on a regimental basis, is now being reorganized to resemble the veterinary service of the regular army.

Responsibility and efficiency go hand in hand, and it is realized in the United Kingdom that no branch of the Army can be of any great value in a critical situation unless it is given authority to take the initiative in duties which are strictly its own. The work of the officers of the army veterinary corps includes the veterinary supervision, the care and treatment of sick animals, the discipline and maintenance of combatants under their charge, and the replenishment of medicines, dressings and other stores. Such duties bring the officers of the army veterinary corps into close touch with the general work of the army. They are as much concerned as those of other units in the provision of food, clothing and other requirements to their men, in arranging their

camps and generally in exercising the same functions as officers of other units with the exception of actual combatant work. This system of training has evolved a class of officer in the veterinary service whose efforts has had a far reaching effect on horse economy and in the improvement in the health of the animals of the British army.

GARRISON STEELE, M.D., D.V.M.

RECENT INVESTIGATIONS OF THE ETIOLOGY OF CONTAGIOUS PNEUMONIA OF HORSES, AND THE SALVARSAN TREATMENT OF THIS DIS- EASE.

Since the above article appeared in the AMERICAN VETERINARY REVIEW of February, 1914, Staff-Veterinarian Luhrs, of the German army, has published the following statement, giving further results obtained in the investigations of this disease:

EXPERIMENTS WITH THE COMPLEMENT-FIXATION METHOD OF CONTAGIOUS PNEUMONIA.

In these experiments an alcoholic extract from lungs of diseased horse was used as an antigen. With this extract complement-fixation bodies show in the serum of every affected horse which is still in the fever stage. The reaction becomes negative after the fever ceases.

A positive reaction could also be observed in some older horses, apparently well, but of which it could not be ascertained whether they had previously suffered from the disease. In newborn foals, and in horses which were known not to have been previously sick with the disease, a negative reaction was constant.

The serum of young horses sick with febrile strangles or septicaemia acted always negative. Two glanders sera did not react to the antigen of contagious pneumonia, neither did the contagious-pneumonia serum on glanders antigen.

Several experiments with extract from bronchial glands of cases of contagious pneumonia correspond with the above results.

The same result was obtained when, instead of the antigen of contagious pneumonia, a liver extract of lues was used as applied in the Wasserman method for human syphilis.

The fact is also noteworthy that human luetic serum produces a complement fixation with the extract of lungs of contagious pneumonia and of the bronchial glands.

In all these experiments, extending over several hundred sera, the necessary controls have been made.

It was not possible to secure a diagnosis of contagious pneumonia based on the Abderhalden dialysis test. Many such experiments were made, but the results obtained were extremely contradictory.

OLAF SCHWARZKOPF.

EXPERT EXAMINATION OF STALLIONS UNDER STATE LAWS.

The *Breeders Gazette*, in its issue of April 2, 1914, brings the following note as correspondence:

THE OHIO STALLION LAW.

In several articles in recent issues of *The Gazette* I have seen mention of the Ohio law for the examination of stallions. I have witnessed quite a number of such examinations recently by the *state expert*. If these were any criterion, the stallion law of Ohio is a farce, pure and simple. It is a well known fact, conceded by the veterinary profession generally, that thick wind and periodic ophthalmia (moon blindness) are hereditary and transmissible. The expert made no test of the wind, and gave only a glancing look at the eyes. The teeth were not looked at. The stallion was not examined to see if he was afflicted with vesicular or coital exanthema. Section 3 of the law says that "upon such examination a certificate shall be issued to the owner setting forth the transmissible defects." Could such a thing be possible with this kind of examination?

Darke Co., O.

STALLION OWNER.

If this statement of the correspondent of the *Breeders Gazette* is correct, it is to be hoped that the "state expert," referred to in this note, was not a veterinarian. If so, he will by his apparent "mildness" of examination do a harm to the intent of the state stallion law, and contribute towards a prejudice against the veterinary profession; destroying in the very beginning the good prospects of a new kind of work that we are in a fair way of winning by our special study and training.

Those of us who have had experience in the examination of stallions and mares for breeding operations know full well that only a thorough examination is just to all, and leads to uniform results. Often it is not an easy task, complicated by the arguments of the owner of breeding stock. The young practitioner will have to add to the phrase of the horse dealer of "serviceably sound" the often heard phrase of the small breeder of "sound for breeding." Particularly the owner of brood mares is apt to regard the most glaring defects of conformation and soundness as "not hereditary, but only acquired," and he will cite textbooks on breeding as his authority, even if it is evident to a layman that the mare is not worth the service of a good stallion.

But here the complaint is reversed, and a stallion owner himself objects to the insufficiency of an examination. The case looks so strange to us that we feel justified in concluding that this examination was not performed by a veterinary "expert," who would certainly have better appreciated and understood the dicta of veterinary science and his responsibility.

OLAF SCHWARZKOPF.

ARTICLES FOR JUNE ISSUE—SOME ALREADY IN TYPE: *Comparative Medicine*, W. H. Dalrymple; *The Production of Artificial Immunity Against Tuberculosis in Animals*, S. H. Gilliland; *Maine Livestock Industry*, A. Joly; *The Tissue Food*, John A. McLaughlin; *The Intercellular Fluid and Its Relation to Health and Disease*, Thomas B. Kenny; *Six Experimental Cases of Tetanus in Carnivora*, L. S. N. Walsh; and several others.

TEXAS OR TICK FEVER is the subject of U. S. Department of Agriculture Farmers' Bulletin 569, by Dr. John R. Mohler, Chief of Pathological Division, Bureau of Animal Industry. This little bulletin of 24 pages, with illustrations, covers every phase of the tick question, and is a valuable medium for the distribution of knowledge to the cattle raisers on this important question.

THE CANADIAN STANDARD MAGAZINE for February, 1914, published at Calgary, Alberta, Canada, was recently received at the REVIEW office, and contains a striking picture of our esteemed collaborator, John Gunion Rutherford, published in connection with a very interesting sketch of Dr. Rutherford's life and activities in Canada, under the head of "Notable Canadians." Most of us feel that we know of all the greatness of this great veterinarian, but the *Standard's* account of his life, politically and in the interests of agriculture in Canada, show him to be even a bigger man than we had conceived him.

REVIEW LIKE OLD STOCK PRESCRIPTION: Dr. H. N. Eames, who has left Livermore Falls, Maine, to open a hospital in Sanford, that state, says in notifying us of his change of address, "I must have the REVIEW; it is like the old stock prescriptions."

SOCIETY MEETINGS.

CONNECTICUT VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the above association was held in Hartford, at Hotel Garde, Tuesday, February 3, 1914. Meeting was called to order at 11.30 a. m. by President Whitney. After reading of minutes of the previous meeting, reports of the secretary and treasurer were read and approved. Two applications for membership were presented and referred to the board of censors.

Officers elected: President, Dr. Geo. T. Crowley; 1st vice-president, Dr. V. M. Knapp; 2d vice-president, Dr. A. T. Gilyard; secretary, Dr. B. K. Dow; treasurer, Dr. Thos. Bland; board of censors, Dr. G. W. Loveland, Dr. Geo. L. Cheney, Dr. H. Whitney, Dr. G. E. Corwin, Jr., and Dr. P. T. Keeley.

Adjourned for lunch at 12.30 and reconvened at 2.30. Under the head of new business, the matter of illegal practice in the state was brought up for discussion, resulting in an action instructing the president to appoint five members, at a future date, to act as a prosecuting committee, and that money be appropriated out of the treasury to defray the necessary expenses of the committee. Later the president appointed Drs. G. W. Loveland, H. E. Bates, J. E. Underhill, H. Whitney and G. V. Towne as members of that committee.

Arrangements were made for holding the semi-annual meeting in Waterbury the first Tuesday in August next. The day will be devoted to surgical clinics, and the banquet and business meeting will be held in the evening.

President Crowley announced that papers for the meeting had been promised by Drs. Gilyard, Loveland and Cheney.

The business being finished, the president called for the reading of papers; as there were no papers to be read, several interesting cases were described by members that had occurred in their practice, which were well discussed and many opinions advanced. Meeting adjourned at 5 p. m.

Members in attendance: Thos. Bland, H. E. Bates, C. H. Beere, G. T. Crowley, G. L. Cheney, G. E. Corwin, Jr., B. K. Dow, P. F. Finnigan, J. J. Flaherty, A. T. Gilyard, L. B. Judson, P. T. Keeley, G. W. Loveland, J. J. Moynahan, J. E. Underhill, H. Whitney, C. R. Witte and I. R. Vail. Visitors: Dr. B. D. Pierce, Springfield, Mass.; T. E. Robinson, Westerly, R. I.

B. K. Dow, Secretary.

B. A. I. VETERINARY INSPECTORS ASSOCIATION OF CHICAGO.

The regular monthly meeting of the B. A. I. Veterinary Inspectors Association was held at the Saddle and Sirloin Club, Friday evening, April 10, 1914.

The meeting was featured with a short talk by Dr. L. Enos Day, pathologist at the Chicago station, on tuberculin, its preparation, and theories as to how it causes the reaction.

Several problems of post-mortem inspection were fully discussed by the members present.

Dr. W. N. Neil, the new inspector in charge, was elected to membership in the association.

B. J. STOCKLER, Secretary.

THE CORNELL VETERINARIAN BECOMES A QUARTERLY.—We notice in the April issue of the *Cornell Veterinarian* that it has started as a quarterly instead of half yearly publication. That suggests progress, and recognition of merit by the profession, and we congratulate its editors. It is a high-class, strictly ethical periodical; qualifications that must attract to it, the right sort of supporters.

VETERINARY PROFESSION REPRESENTED: In looking over the excellent programme of the Louisiana State Medical Society, which held its 35th annual meeting in New Orleans, April 20 to 23, we find the veterinary profession represented by Drs. A. D. Melvin, W. H. Dalrymple and R. W. Tuck. We frequently see physicians' names on the programmes of veterinary meetings, and should like to see veterinarians' names *more frequently* on medical association programmes. It is a healthy cross.

GERMAN OFFICIAL RESPECT FOR THE HORSE.—An attache of the American Embassy in Berlin sends a circular that is being distributed through the German Army, as follows:

MEN AND HORSES.—In the army of the Fatherland horses have always played an important part. We owe a great debt to our horses for service, both in times of war and peace.

And it is hoped that all good soldiers will see to it that the rights of our dumb brothers are respected.

Our horses are entitled to food, water, bedding and shelter just as exactly as a trooper is.

But beyond this it must be remembered that a horse should not be insulted or distressed, either by cruel treatment or vehement language. * * * —(*The Horse Lover*—April, 1914.)

NEWS AND ITEMS.

SECRETARY MAYO BIDS FOR FIVE HUNDRED NEW MEMBERS: In starting on the second half of the century run of the A. V. M. A., Secretary Mayo is putting forth his best energies, and expresses an ambition to increase the membership by 500 members this year. With a continuation of the healthy condition now enjoyed by the association, growing steadily better from year to year, such a thing is quite within the range of possibility if every present member lends his little "boost." See how many *you* can bring in.

UNITED STATES CIVIL SERVICE EXAMINATION—VETERINARIAN (MALE)—MAY 20, 1914.—The United States Civil Service Commission announces an open competitive examination for veterinarian, for men only, on May 20, 1914. From the register of eligibles resulting from this examination certification will be made to fill vacancies in the position of veterinary inspector in the Bureau of Animal Industry, Department of Agriculture, at entrance salaries of \$1,400 per annum, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

It is probable that a large number of appointments will be made in the near future.

Competitors will be examined in the following subjects, which will have the relative weights indicated:

Subjects.	Weights.
1. Letter writing	10
2. Veterinary anatomy and physiology	20
3. Veterinary pathology and meat inspection	30
4. Theory and practice of veterinary medicine	30
5. Education, training and experience	10
Total	100

This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply to the United States Civil Service Commission, Washington, D. C.

DR. S. R. HOWARD CONVALESCENT: The many friends of Dr. Howard, Hillsboro, Ohio, will be glad to learn that the doctor is now convalescent after a pretty hard siege, first from illness, then from an accident, which resulted in the breaking of some ribs. He has our sincere sympathy.

DR. S. E. BENNETT LEAVES CHICAGO, WHERE HE HAS BEEN INSPECTOR IN CHARGE OF THE B. A. I. SERVICE FOR EIGHT YEARS.—The employees of the B. A. I. Service in Chicago gave a "Smoker" to Dr. Bennett at the Saddle and Sirloin Club on the evening of April 1st, and extended a welcome to his successor, Dr. W. N. Neil. Dr. Bennett has been placed in charge of hog cholera eradication in Indiana, with headquarters at Crawfordsville. Many after-dinner addresses added to the evening's enjoyment.

DINNER TO NEW YORK PHYSICIAN FIFTY YEARS IN PRACTICE.—The colleagues and friends of Faneuil D. Weisse, M.D., gave him a dinner at the Hotel Astor on March 28th last, at which 300 of his colleagues in the medical and dental professions, and friends, were present to honor the good doctor and celebrate the occasion of his fiftieth year in practice. Dr. Weisse is known to the medical profession everywhere, who acknowledge him as a past master in anatomy—having written standard works on it—and as the father of dental surgery in America; which branch of surgery he raised to its present high standard in this country. And to-day, as Dean of the New York College of Dentistry, he is still exerting his best efforts in behalf of that branch of human surgery. But the name, Dr. Faneuil D. Weisse, also means much to the veterinary profession of America. Graduates of the American Veterinary College prior to its amalgamation with the New York College of Veterinary Surgeons in 1899, affectionately remember Dr. Weisse and his kindly words of advice in his opening addresses to the students each year. Those men whose privilege it was to have listened to him will never forget him, whether it was 29 years ago or 15 years ago, and will always associate the name of Faneuil D. Weisse, M.D., with the American Veterinary College; as he has always been a close friend of Prof. Liautard, and officiated as Secretary of the Board of Trustees from 1875 to 1885, and President of the Board from 1885 until the amalgamation and adoption by New York University in 1899. His place in the hearts of his friends and colleagues was attested by the festive gathering in his honor on March 28th, at which gathering (although fifty years active professional work lay behind him) he was among the merriest of those present.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	Mar. 5-6-7, 1914	Auburn.....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	June 10, 1914.....	141 W. 54th St.	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.....	Dec., 28-31, 1914	New Orleans, La	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n.....	January 5-6, 1915	Little Rock....	R. M. Gow, Fayetteville.
Ass'n Médécalle Veterinaire Française.	1st and 3d Thur. of each month.....	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	S. Omaha, Neb.	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n.....	Monthly.....	St. Joseph and vicinity	F. W. Caldwell, St. Joseph, Mo.
California State V. M. Ass'n.....	December 10, 1913.....	San Francisco..	John F. McKenna, Fresno.
Central Canada V. Ass'n.....	Feb. and July.....	Ottawa.....	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Syracuse.....	W. B. Switzer, Oswego.
Chicago Veterinary Society.....	2d Tues. each month.....	Chicago.....	D. M. Campbell, Chicago
Colorado State V. M. Ass'n.....	May 28-29, 1914	Ft. Collins.....	I. E. Newsom, Ft. Collins.
Connecticut V. M. Ass'n.....	Aug. 4, 1914.....	Waterbury.....	B. K. Dow, Williamantic.
Delaware State Vet. Society.....	Jan. Apl., July Oct.....	Wilmington.....	A. S. Houchin, Newark, Del
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Newark, N. J.....	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n.....	2d week, July 1913.....	Rochester.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Atlanta.....	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y.....	1st Sat. each month.....	Wash., D. C.....	I. M. Cashel.
Hamilton Co. (Ohio) V. A.....	.....	.....	Louis P. Cook, Cincinnati
Illmo Vet. Med. Ass'n.....	Mar. 26, 1914.....	Belleville, Ill.....	L. B. Michael, Collinsville, Ill.
Illinois State V. M. Ass'n.....	December, 1913.....	Chicago.....	L. A. Merrillat, Chicago.
Indiana Veterinary Association.....	Jan. 14, 1914.....	Indianapolis.....	A. F. Nelson, Indianapolis.
Iowa Veterinary Ass'n.....	Pending.....	Pending.....	C. H. Stange, Ames.
Kansas State V. M. Ass'n.....	Jan. 6-7-8, 1914.....	Manhattan.....	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.....	Oct & Feb. each year	Lexington.....	Robert Graham, Lexington.
Keystone V. M. Ass'n.....	2d Tues. each month.....	Philadelphia.....	Cheston M. Hoskins.
Lake Erie V. M. Association.....	Pending.....	Pending.....	Phil. H. Fulstow, Norwalk, Ohio.
Louisiana State V. M. Ass'n.....	Sent., 1914.....	Lake Charles.....	Hamlet Moore, New Orleans, La
Maine Vet. Med. Ass'n.....	July 3, 4, 1914.....	Houllon.....	H. B. Wescott, Portland.
Maryland State Vet. Society.....	.....	Baltimore.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	4th Wed. each month	Young's, Boston.....	J. H. Seale, Salem.
Michigan State V. M. Ass'n.....	Feb. 3, 4, 1914.....	Lansing.....	W. A. Ewalt, Mt. Clemens.
Minnesota State V. M. Ass'n.....	Jan. 14-15-16, 1914.....	St. Paul.....	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.....	Jan. 27, 28, 29, 1914	Kansas City, Mo.	Hal. C. Simpson, Denison, Ia.
Mississippi Valley V. M. Ass'n.....	Semi-Annually—Call of Chair.....	Galesburg, Ill.....	G. E. McIntyre, Alexis, Ill.
Missouri Vet. Med. Ass'n.....	July, 1913.....	Kirksville.....	S. Stewart, Kansas City.
Montana State V. M. A.....	Sept. 24, 25, 1913.....	Helena.....	A. D. Knowles, Livingston
Nebraska V. M. Ass'n.....	1st Mo. & Tu., Dec. '13	Lincoln, Neb.....	Carl J. Norden, Nebraska City.
New York S. V. M. Soc'y.....	August 11-12-13, 1914	Rochester.....	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.....	June, 1914.....	Wilson.....	J. P. Spoon, Burlington.
North Dakota V. M. Ass'n.....	Week of July 20, 1914	Fargo.....	A. F. Schalk, Agricultural College.
North-Western Ohio V. M. A.....	Nov. 1913.....	Delphos.....	E. V. Hoyer, Delphos.
Ohio State V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med.....	Annually.....	Upper Sandusky.....	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.....	.....	.....	J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.....	Fall, 1913.....	Oklahoma City.....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.....	1st Week in Feb. 1914	Toronto.....	L. A. Willson, Toronto.
Pennsylvania State V. M. A.....	Mar. 3, 4, 1914.....	Philadelphia.....	John Reichel, Glendon.
Philippine V. M. A.....	Call of President.....	Manila.....	David C. Kretzer, Manila
Portland Vet. Med. Ass'n.....	4th Tues. each month.....	Portland, Ore.....	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.....	.....	Mon. and Que.....	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Jan. and June.....	Providence.....	J. S. Pollard, Providence.
South Carolina Ass'n of Veter ns.....	Pending.....	Pending.....	B. K. McInnes, Charleston.
South Illinois V. M. and Surg. Ass'n.....	Aug. 4-5-6 1914.....	Salem.....	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors.....	1st Wed. fol. the 2d Sun. each month.....	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Schuykill Valley V. M. A.....	June 17, 1914.....	Reading.....	W. G. Huyett, Wernersville
Soc. Vet. Alumni Univ. Penn.....	.....	Philadelphia.....	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.....	Pending.....	Madison.....	S. W. Allen, Watertown.
Southern Aux. of Cal. S. V. M. Ass'n.....	Jan. Apl., July, Oct.....	Los Angeles.....	J. A. Dell, Los Angeles.
South St. Joseph Ass'n of Vet. Insp.....	4th Tues. each month.....	407 Illinois Ave.	H. R. Collins, South St. Joseph
Tennessee Vet. Med. Ass'n.....	November, 1914.....	Nashville.....	O. L. McMahon, Columbia.
Texas V. M. Ass'n.....	Nov., 1913.....	College Station.....	Allen J. Foster, Marshall
Twin City V. M. Ass'n.....	2d Thu. each month.....	St. P.-Minneapolis.....	M. H. Reynolds, St. Paul, Minn
Utah Vet. Med. Ass'n.....	Spring of 1914.....	Salt Lake City.....	E. J. Coburn, Brigham City.
Vermont Vet. Med. Ass'n.....	.....	.....	G. T. Stevenson, Burlington
Veterinary Ass'n of Alberta.....	.....	.....	C. H. H. Sweetapple, For. Saskatchewan, Alta., Can
Vet. Ass'n Dist. of Columbia.....	3d Wed. each month	514 9th St., N.W	M. Page Smith, Washington, D. C.
Vet. Med. Ass'n, Geo. Wash. Univ.....	1st Sat. each month.....	Wash'ton, D. C.....	J. M. Cashel, 2115 14th Street.
Vet. Ass'n of Manitoba.....	Feb. & July each yr.....	Winnipeg.....	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.....	January 8, 1914.....	Trenton.....	E. L. Loblen, New Brunswick.
V. M. Ass'n, New York City.....	1st Wed. each month.....	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.....	Monthly.....	Jersey City.....	T. F. O'Dea, Union Hill, N. J.
Virginia State V. M. Ass'n.....	July 9-10 1914.....	Staunton.....	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.....	1st & 3d Fri. Eve.....	Pullman.....	R. J. Donohue, Pullman.
Washington State V. M. A.....	June 18-19, 1914.....	Walla Walla.....	Carl Cozier, Bellingham.
Western Penn. V. M. Ass'n.....	3d Thu. each month.....	Pittsburgh.....	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.....	Feb. 10, 11, 1914.....	Milwaukee.....	W. W. Arsbarger, Watertown
York Co. (Pa.) V. M. A.....	June, Sept., Dec., Mar.....	York.....	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

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Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

GREAT INDIANAPOLIS DRUG HOUSE MAKES SLIGHT CHANGE IN NAME: By the request and with the unanimous consent of all the stockholders, the "PITMAN-MYERS COMPANY" has changed its name to "PITMAN-MOORE COMPANY."

There has been no change whatever in the personnel of the officers, directors, stockholders, or in the management of the business. Harry C. Moore, whose name now becomes part of the corporate name, has been president of the company and has had the general management of the business for several years. Advertisement running on page 3 (Adv. department.)

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., OF THE AMERICAN VETERINARY REVIEW, PUBLISHED MONTHLY AT 509 WEST 152D STREET, NEW YORK, N. Y., REQUIRED BY THE ACT OF AUGUST 24, 1912.

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ROBT. W. ELLIS, Bus. Mgr.

Sworn to and subscribed before me this 10th day of March, 1914.

(Seal.)

MOSES MORRIS, Notary Public,
New York County, No. 133, New York Register No. 4049.
(My commission expires March 30, 1914.)